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Industrial FINISHING

Published Monthly in the Interest of Modern Production Finishing

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The Heywood-Wakefield Company has used Zapon wood lacquer and sealer for a number of years. When the Company had an air-dry system, Zapon finishes suitable to such production were employed.

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Reprinted from Furniture World
Special Heywood-Wakefield 115th Anniversary Issue

Seventeenth Year of Publication

Industrial FINISHING

Reg. U. S. Pat. Office

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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Flock Wanted

Will you please send us the names and addresses of manufacturers of flock?—G. P.

See advertisements on pages 7 and 108 of February isue of INDUSTRIAL FINISHING.—ED.

One-Coat White

We would like to inquire if you know of any improved formula which might be available for turning out a neat and good looking one-coat white baked-on enamel job on black sheet-steel parts? We are now finishing in ivory and green, in a satisfying manner, with one coat. However, the trade has been asking for a white enamel finish. At the price our product is sold for, we cannot afford a two-operation finish, therefore we would like to know if you are acquainted with any formula or finished material which might be obtained for our purpose.—N. Co.

Portable Sanders

I have just completed an interesting talk with your Mr. C. A. Larson regarding the practicability of using an air-driven portable sander. Mr. Larson informs me that you are familiar with this type of equipment and that I should write you regarding it. Two questions are of particular interest to me:

1) Advantages and disadvantages of the air or electric-operated mechanical hand sanders on woodwork and finishes.

2) Do these manufacturers have representatives in the East?—L. W. Co.

We hesitate to take on the responsibility of making recommendations without being familiar with your shop conditions and the exact nature of the work that you plan to do. Our suggestion is that you have representatives of the manufacturers call and demonstrate their machines in actual production. Then your production man can judge which type of machine is more suitable for his work.

In order to give you quick service on your inquiry we are notifying some of the leading manufacturers of portable sanders about your letter, and we feel sure that they will notify their eastern representatives promptly.—ED.

Lacquer for Jamaica

On page 6 of your November 1940 issue of INDUSTRIAL FINISHING there appeared a letter to you from Mr. X., Kingston, Jamaica, B. W. I., asking for a source of supply for lacquers.

As you may not know, because of war-time regulations, lacquers going into Jamaica must be imported from a British source, due to the fact that

The last word in new finishes!

VINDOLAC

Heavier bodied—Tougher
Smoother flow
No shrinkage

LIQUOR PROOF
A full 27% solids—
Licensed, guaranteed

Order five gallons NOW, and if **VINDOLAC** is not all we claim for it, just tell us and full credit will be given.

V. J. DOLAN & CO., INC.
"Unquestionable Quality" Industrial Finishes
1830 NORTH LARAMIE AVENUE **CHICAGO, ILLINOIS**

Here's a remarkable achievement—and product

A FLAT VARNISH MADE 100% OF GUM

Perfection Flat Finishes contain no stearates or resinates or other flattening agents. They are as clear as gloss varnishes having no milky appearance found in conventional flat varnishes. They are waterproof, liquor-proof, proof against milk, rancid butter and grease, urea, etc. Free from orange peel — look like rubbed finish—available for air dry or force dry at elevated temperatures. Also, our SEALER VARNISH covers 65% more surface than lacquer sealers.

Panels coated with Perfection Flat Varnish can be immersed in water for 30 days without turning white or showing any other ill effects. Write us and we'll send panels and samples—and also a panel in water for 30-day immersion test.

PERFECTION PAINT & COLOR CO.
Indianapolis, Indiana

all American currency which these colonies can obtain is used by the British Government for the purchase of war materials in the United States, and because of this fact, public spending in the United States from these colonies is more or less prohibited, unless the article cannot be obtained from a British source.

We manufacture lacquers and we would appreciate it if you would refer this gentlemen in question to our company, as we can supply him with his requirements.—The Murphy Paint Co., Ltd., Montreal, Quebec, Canada.

Finish for Rubber

We are interested in trying to get some finish that will impart a nice black gloss to rubber goods. If you have something of this nature, kindly submit a small sample and price.—B. B. Co. (Household Rubberware).

Black Finish for Metal

We are attempting to locate a material which will give us an "ebonized" finish on machine screws. Several of our competitors are now doing this type of finishing but we are unable to find either a finisher to do this work or a source of supply for the material itself. We would appreciate any and all information that you can give us regarding this finish.—H. S. Co. (Screws, Bolts, Nuts).

We have supplied this company with the names of two concerns who, we believe, can furnish just what is wanted—a coloring applied by hot chemical bath.—ED.

Hot Lacquer Outfit

Some 18 months or two years ago the writer saw in your columns, either an article or an advertisement of a small electrically-heated spray outfit for experimental testing of hot lacquer.

We have hunted through all the copies of INDUSTRIAL FINISHING that we have in our bookcase, which means practically every volume for the last six years, and we cannot find this heated gun.

We find many references to the apparatus of the M. & E. Mfg. Co., and communication with them only brings back the information of the complete set with separate container, hose, and pump, which was not what we had in mind.

Have you any record which would

Flo-Bak SYNTHETIC BAKING ENAMELS

Our improved Flo-Bak will enhance the beauty and increase the utility of your finished products.

(1) Lustre
(2) Adhesion
(3) Flexibility
(4) Wearability
(5) Acid, Alkali, Resistance
(6) Grease Resistance

Our extensive laboratories are at your service for any finishing problem.

Flo-Bak is attainable in clears, blacks, whites and colors.

Full information and samples will be sent on request.

LACQUERS THINNERS ENAMELS METALIZED FINISHES SYNTHETICS

UNITED LACQUER MFG. CORP.

General Offices and Factory: Linden, New Jersey

Kindly mention INDUSTRIAL FINISHING when writing advertisers

enable you to advise us which of your clients may have advertised the small unit we have in mind?—T. U. Co. (Airplane Finishes).

We have advised this company of the names of manufacturers whose equipment has received publicity in INDUSTRIAL FINISHING.—ED.

Tumble Finishing

We have been informed that you are an authority on plans and methods for painting and finishing. We will appreciate getting all the information you can give us on the tumbling type of painting for very small pieces. All we know about it is that the articles to be painted and the paint are put into a drum-like machine and rotated. We would like to know the types of machines, the manufacturers thereof, the type of paint or lacquer, and the best sources, and the method of use. —E. M. Co.

We are sending you tear sheets of two of the several articles we have published on this subject. There has been such a demand for information along this line that our supply of back copies containing other articles on tumble finishing is exhausted. However, we believe that you will derive considerable information from reading the pages we are sending you. We are also giving you (by letter) the names and addresses of manufacturers of tumble finishes and tumbling barrels. —ED.

Complaint About Finish on Stoves, Refrigerators

During the past year the company I am with (a storage and transfer company in Cleveland, Ohio) has had to stand quite a large loss as a result of many stoves and refrigerators being damaged, mostly stoves, and through no fault of our men in handling or packing.

Vibration of the truck or car and men carrying the stoves apparently caused enamel to chip off the bottom ends of panels next to base and legs.

When it comes to crating, our company uses heavy lumber and plenty of pads—much in excess to what the stove companies do.

There is no question here about quality of material, but there must be a serious fault some place before finishing starts, as at the edges of panels and places where handles and hinges are the enamel chips off easily. I have examined many of the damaged places and found it very easy to pick or peel off the finish. I have seen many of them where the metal had been filled

"CALL ON WALKER"

Dozens of manufacturers in many different industries have saved thousands of dollars in time, labor and material after they "Called on Walker."

Many difficult finishing problems presented to us by these manufacturers have been solved by Walker's modern laboratory staff. Investigate your present finishing materials and schedules, check them against the latest developments, you too may decide to "Call on Walker."

Walker's modern production finishes include . .Chromate Primers . . Fillers . . Synthetic Enamels including High Speed short bake . . Lacquers for every purpose . . Wrinkles and a variety of other decorative, protective and specialty finishes.

If you want to speed up production and save money in your finishing operation on regular production or on new defense orders "Call on Walker."

H. V. WALKER CO.

MODERN PRODUCTION FINISHES

Elizabeth, New Jersey

FORM - A - ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM - A - ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM - A - ROC

Baking schedule is of great flexibility, permitting from 5 - 50 minutes at 250 - 375° F.

FORM - A - ROC

No matter which of the present worthy finishes of this type you may be using or planning to use, we sincerely recommend that you investigate

FORM - A - ROC

MADE BY

THE VARNISH PRODUCTS CO.

5208 Harvard Avenue

CLEVELAND, O.

in and had a smooth glaze like feel to it.

Plenty has been written this past year in INDUSTRIAL FINISHING about metals and much emphasis has been placed on the cleaning process.

Another thing is the off-color. Quite a number of times I have had to return parts on account of off-color.

Recently I went to one of the largest stove companies in the country and it really is unbelievable the difficulty we had in trying to match white panels for the top of a stove. With the foreman of the stock and assembly room, we went through parts for about 50 stoves of the type I wanted, "1940," and there were not two pieces of white to match.

I asked him what he did in a case like this. He said, "We just have to use them," so there was nothing else for me to do but take what I could get and replace same to the dissatisfaction of the customer. I'll be very glad to furnish the name of the stove and customer.

There is one stove sold here that never has given any trouble or worry. Readers of this magazine will recall that the mixers and spray men are under medical attention all the time to watch for fatigue and eye strain.—Geo. Watt.

Tobacco Cloth for Wiping

In your October issue, on page 64, we are interested to read an article on the subject of "Tobacco Cloth for Wiping Filler". We have no experience with a wiper by such a name on this side, and as the process of wiping off polish is a problem we are equally interested in, would be glad if you could send us a sample of the material in question, or failing this, let us knows its correct manufacturer's name and address. You will appreciate, of course, that it would be far more satisfactory if you could send us a sample, however small.—H. L. (Mfrs. of Furniture) ENGLAND.

Tobacco cloth resembles cheesecloth. We are notifying a few U. S. A. manufacturers about your inquiry. —ED.

Decorative Durable Window Shades

We have just read with considerable interest the article by Mr. Harry L. Hiett, in your January issue, entitled "Decorating Fine Fabrics." On page 26, a reference is made to window shades of a new material. Mr. Hiett's exact comment is:

(Continued on page 76)

Window Shopping

has assumed the proportions of a national pastime. Modern, up-to-date stores know this and number their windows for easier identification.

As a manufacturer, you cannot afford to disregard this basic fact — that 87% is seeing. The shopper judges by what she sees, and she looks at and sees the finish first of all.

The finish determines the sale.

It is important to *choose the* SUPERIOR FINISH!

Knowing is better than guess work.

LACQUERS
SEALERS
STAINS
ENAMELS
FILLERS

STILLE-YOUNG

Manufacturers - Chicago

Equipment for Painting

IN REVIEWING many inquiries about the finishing of shells, bombs and ordnance equipment, there seems to be a great deal of interest in what methods to follow to get maximum speed and efficiency in this particular coating problem.

This article is an attempt to show the accepted standards of finishing ordnance equipment, ranging from 37-mm. shells to 2000-lb. demolition bombs. Manual equipment, semi-automatic and full-automatic equipment are all considered.

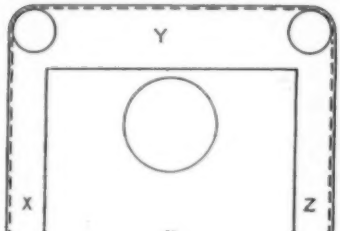


Fig. 1—Plan view of spray booth and conveyor that carries shells to and from spraying zone, SS. Shells are put on and taken off the chain conveyor at any of the three sides, X, Y, Z, according to the individual arrangement of the equipment.

Oscillating arm No. 1 (A) is equipped with an air-operated spray gun for coating the interior of shells.

Oscillating arm No. 2 (B) is equipped with an air-operated spray gun for coating the exterior of shells.

Sides X, Y and Z, of the conveyor line, are extended or can be extended in any direction to provide greater length to accommodate drying equipment.

Equipment for Coating 37-mm. Shells

Due to the odd shape of the 37-mm. shell — in regard to having both ends open, both ends threaded, and the rotating or rifling band approximately central—and due to Government specifications calling for the protection of threads and rifling band, plus the added job of *coating the inside of the shell with an acid-proof black paint and the outside with a fast-dry yellow lacquer*, the consideration of rapid finishing offers some complicated problems.

To date, the production requirements on this size shell have meant the employment of finishing equipment that is fully automatic. The accompanying illustrations, with explanations of same, reveal in a general way, how this is accomplished with certain types of equipment. Of course, you must know something about modern spray-finishing apparatus and conveyors to understand what follows.

A plan view of the spray booth and conveyor line appears in Fig. 1.

Coating the inside of the 37-mm. shell is something of a problem because of the fact that both chambers are connected by a small hole about 3/16-in. in diameter, as shown in Fig. 2. This is not sufficient to allow paint spray directed from one end to penetrate through to the other end. However, with the apparatus illustrated, complete coating is accomplished by placing the shells in opposite positions in fixtures on the conveyor chain. In

Shells and Bombs » » »

BY J. HARRISON
Engineer, Binks Mfg. Co.

other words, one shell is positioned with its nose up, and the next shell with its nose down, as shown in Fig. 2.

When these shells pass through the spraying zone they make contact with "gun-mounting oscillating arms." These arms are equipped with spray guns that have been adjusted to concentrate their spray on a specific surface of the shell. One set of guns is trained on the inside of the shell while the next set of guns, mounted on the second arm, is trained on the outside of the adjacent shell.

As the shells enter the spraying zone (SS, Fig. 1) they are immediately rotated at the required speed. On further entry within the spray zone the shells "pick up" their respective arm and guns, causing the guns to open and spray. The arm follows with the shell for the required distance to give complete and adequate coating.

From the spray zone the shells are carried to the unloading and transfer zone, where they are either unloaded or inverted for their second or final coating on the opposite ends. It must be noted that each shell, on its travel from the spray booth to the unloading or transfer zone, must either pass through a tunnel of infra-red lamps or a drying oven, or be removed, fixture and all, and placed in a box-type oven to dry the paint on the outside before it can be handled.

Prior to spraying the shell, a protective sleeve must be inserted in the threaded end to mask the threads from paint (F and G, Fig. 2). The rotating or rifling band (outside middle section) is protected by the design of the fixture which carries these shells through the loading, spraying, transferring, drying and unloading zones.

75-mm. and Larger Shells; Spray Method No. 1

The problem of coating the larger shells is how to reach far into their insides and give complete uniform coverage. To date, two different methods of coating these shells have been proposed.

Method No. 1 is similar to the method just described for finishing 37-mm. shells. This method is often desired by manufacturers who

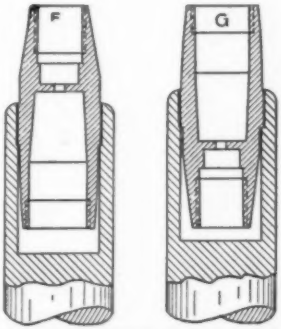


Fig. 2—Cross section of 37-mm. shells inserted in fixtures which, in turn, are centrally drilled at their lower ends (not shown here but included in Figs. 3 and 4) so they can be placed in vertical position on the extended pins of conveyor chain, as shown in Fig. 4. Before spraying begins, shields or masks are placed in the threaded ends (F and G) to prevent the threads from being coated.

This drawing shows shells in position for operations No. 1 and No. 2 respectively, each operation resulting in the coating of that part of the interior and exterior of the shell that protrudes above fixture.

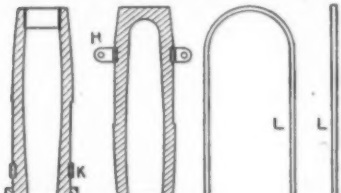


Fig. 3—Showing 75-mm. shells in position in fixtures which are placed on alternate chain pins of the conveyor, for operations No. 1 (spraying inside) and No. 2 (spraying outside) respectively.

Before the inside is sprayed, a shield or mask must be positioned in the open end to prevent the threads from being coated. Before the outside is sprayed, the masking and handling band H, must be positioned around the copper band K of the shell. Copper band K, must not be painted.

The masking-handling band H, slips over the copper band of the shell and clamps firmly into position. A handling hook for engaging the holes in this band H, is shown by the two views marked LL.

have conveyorized ovens that can be converted or adapted to the drying of paint on these shells. The merit of this method is that it uses a machine requiring less floor space —and eliminates the need of an oven entirely if suitable air-drying racks can be installed. The finishing procedure with this type of equipment is as follows:

1) Shells are loaded on the chain conveyor on opposite spindles, that is, one up and the next one down. The masking-handling band (H, Fig. 3) should be installed prior to loading.

2) Shells enter the spray zone (SS, Fig. 1) where they "pick up" the respective spray arms. One arm is equipped with an air-operated piston to lower and raise the spray gun into the shell interior, and one is equipped with the necessary guns to spray the shell exterior.

3) After the shells have passed through the spray zone they are carried to the transfer and unloading zone. It can be seen that after the first cycle of the conveyor chain we are ready to: a) remove a completely finished shell from the conveyor chain; and, b) transfer a shell from an adjacent fixture (on which it received the first operation or interior coat) and place it on a fixture that has been vacated by a completed shell. Each shell must make two trips through the spraying zone (SS, Fig. 1).

Method No. 2 for Coating 75-mm. Shells

For coating 75-mm. and larger shells by Method No. 2, there is available an automatic unit that is self-contained—that is, it includes spray finishing, drying or baking and unloading. These shells are placed in a fixture similar to the one illustrated in Fig. 4. As shells pass into the spray zone they engage oscillating arms mounted with the same spray equipment as described in Method No. 1. In this method each arm "picks up" every shell (instead of every other shell, as in Method No. 1) thus resulting in a completed shell on every chain spindle that passes through the spraying zone.

After the shells pass from the spray booth they immediately enter a bank of infra-red lamps or other type of oven, where the finish is baked for the required length of time at a specified baking heat. Passing from the oven they are then unloaded from the conveyor and removed to the storage room.

In addition to the fully automatic equipment just described there is

also a line of semi-automatic equipment available for doing this work. In the semi-automatic set-up, an operator actuates a hand valve at the proper time to cause the spray nozzle to enter and spray the interior of the shell as the shell rotates in horizontal position on rollers.

Operation No. 2 (spraying the outside of each shell) requires that the operator either handle the spray gun or control the spraying of fixed guns while the shell rotates by power.

Bomb Coating Equipment

Bomb-coating equipment, as shown in the plan view marked Fig. 5, is suitable for bombs ranging from the 100-lb. to the 2000-lb. demolition size. As shown on the drawing, the bombs are received from the cleaning and washing station, and enter the side of the spray booth where they are deposited in a bomb-rotating unit (A, Fig. 5).

It is understood that prior to the bomb's entry into the rotating unit, the thread-masking and handling-platform are to be installed on the tail of the bomb, while a screw-eye or hook is to be installed in the nose. After this has been done the operator actuates a valve that causes the spray arm to enter the bomb and spray its interior, as previously explained in the shell-coating unit. Following this operation the workman trips the rotating unit, ejecting the bomb and depositing same in the up-ending unit (B, Fig. 5). A second workman then either manually or automatically up-ends the bomb to vertical position and engages an overhead hoist to the screw-eye in the nose of the bomb. Then he lifts it to the hand-operated turntable (C, Fig. 5) for the hand spraying of bomb exterior.

After the spray-coating operations are completed a workman pushes the bomb to the pneumatic lift (D, Fig. 5) where it is raised to a height that will accommodate the conveyor hooks which carry it to the oven or storage room.

Extreme caution and care must be used when coating the insides of shells or bombs with the acid-proof black paint. The insides of these shells and bombs are given a rigid inspection by Government Inspectors who look for unpainted and improperly painted surfaces. If the slightest bare spot remains on the inside of a shell or bomb, this place is likely to rust. If this occurs, pitric acid will form, and this can result in an untimely explosion of the bomb.

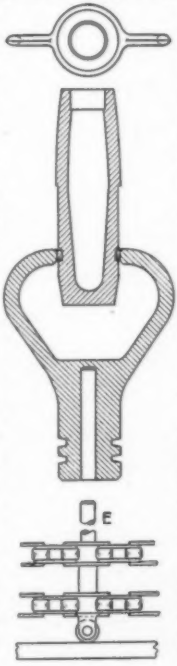


Fig. 4—A 75-mm. shell in position in a fixture which permits both inside and outside of shell to be completely coated in one pass through the spraying zone. The two prongs of the fixture engage the shell only around the copper rotating band (K, Fig. 3) which must remain clean and unpainted.

Below is a side view of links in the 2-strand chain conveyor, showing the extended chain pin E, for carrying shell fixtures. The chain pins are on 12-in. centers and each one has a roller support as shown.

Inside and Outside Coating

In reviewing the methods of coating these shells and bombs, it can be seen that all precautions have been taken to insure complete coating by rotating

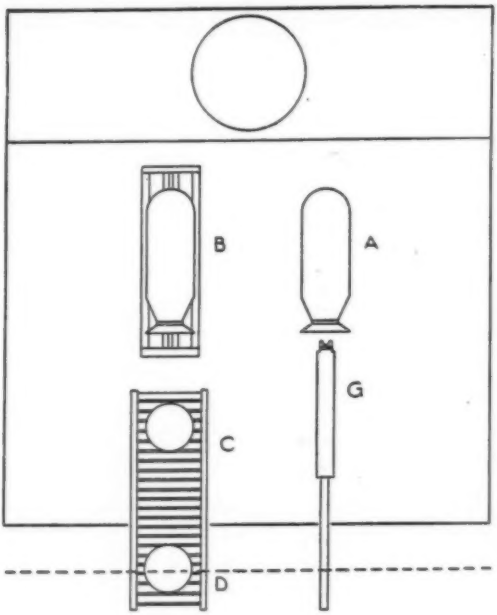


Fig. 5—Plan view of spray booth equipped with apparatus for spray-coating the exterior and interior surfaces of large bomb shells. The marks A, B, C and D indicate stations where: 1) The shell is rotated while its interior is coated; 2) the shell is upended; 3) the open end shell is placed on a turntable and rotated while operator sprays its exterior surface; 4) the shell is engaged by an automatic lift and moved by conveyor (see dotted line) to oven or storage space. A traveling hoist, operating under an I-beam, is used for transferring shells from the upending station B, to the turntable C. From stations C to D, shells move by a gravity roller conveyor.

all this ordnance equipment and entering the cavities with the spray gun in a fixed position.

My experience, to date, *in regard to finishing the exterior of shells and bombs* has shown that a *minimum of paint, or a mist coat, is all that is required—just enough to prevent rust.* This, of course, applies to the manufacturer of the shells and bombs just described. It must be remembered that these shells and bombs receive a final outside coating of various color codes at the shell and bomb filling plants.

Metal cleaning compounds for use by hand or in continuous conveyor washers, paint strippers and various polishes are included in the line manufactured by a concern who writes: "We manufacture specialty alkali cleaners of every description for cleaning steel and iron parts. We will supply samples of our products for any firm desiring samples for test, free of charge."

Mechanical Striping

I HAVE noticed several letters in INDUSTRIAL FINISHING in regard to mechanical striping. After a little experience a worker can do an excellent striping job with a real quality striping tool. I have in mind the type of tool that rolls the striping fluid on with a wheel. A container of striping fluid in the

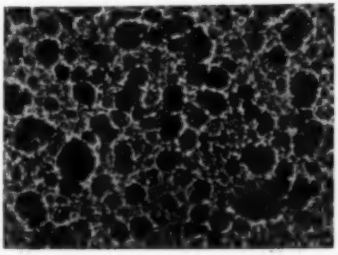
tool (as in a fountain pen) supplies the wheel as it is rolled over the surface being striped. These wheels are available in various sizes and they can be arranged to lay single or double stripes on flat, curved or circular surfaces.

It is comparatively easy to learn how to use a striping tool expertly. However, suitable striping colors must be employed and the fluid must be of correct consistency. I prefer to have the striping fluid about like cream. If it is thick the stripe will be uneven and rough. A very little pressure is required on the wheel in order to make a smooth uniform stripe.

Various guides come with modern striping tools so that the workman can gauge the position of his stripes accurately.—J. K. C.

Metallic Finish with Hammered Effect

METALLIC finishes formulated on a synthetic base and containing bronze or aluminium powders are used effectively for producing an attractive "hammered" appearance. The term "hammered" describes a finish that has small "pitted" circles varying in size and design — simulating the appearance of a metal surface that has actually been hammered with a peen-faced hammer. However, the hammered finish is smooth to the touch, whereas actually hammered metal surfaces have many small shallow dents produced by hammering.



An example of decorative hammered finish.

This hammered metal finish can be formulated in a variety of colors, such as blues, grays, browns, gold, silver and many other decorative colors.

Several preliminary steps are necessary to obtain successful results. One of the most important is to make certain that the metal is perfectly clean and free from any oily or greasy substance, in order to insure permanent adhesion after the finish is baked. Unless the metal surfaces have been thoroughly cleaned by a modern degreasing or commercial metal-cleaning process, I suggest that they be cleaned with solvents such as toluol, xylol, or a mixture of the two in the ratio of 2 to 1, with V.M.P. naphtha.

The "hammered finish" material is generally sprayed at 60-lbs. air pressure at the gun. A simple second coat is required to complete the ornamental design. The bake usually requires one hour at 250° F. in an oven. In our laboratory we use an electric oven for baking the finish on sample panels and small articles.

The viscosity of the material is quite important too, because this material is sprayed at full-body in order to produce the essential film thickness needed to get proper results. An experienced spray man, working with this material, soon becomes accustomed to it and can produce a variety of patterns in the hammered finish.—JOSEPH TOKARZ, Laboratory Technician.

Machine Tool

THE painting of cast-iron parts for machine tools and the final finishing of the completed machine calls for something more than just spreading paint over metal surfaces. It includes: first, the preparatory work of thorough metal cleaning; then prime coating; filling to build up the rough surfaces so they will be smoothly streamlined; drying and sanding the filler; and the application of sealer and intermediate coats. After assembly of the completed machine there are such operations as cleaning, spot-puttying and spot-painting of damaged places, the masking of certain parts, and the final spray painting of the entire machine with a coat of machine-tool gray enamel.

The Heald Machine Co., Worcester, Mass., builds a line of excellent grinding and precision boring machines, and the finish on these machines is in keeping with their splendid performance and fine quality. The following brief outline, with numbered illustrations, presents some highlights of the finishing methods employed in the company's plant.

Castings, after being weighed, move into the "snagging" room where they are "rough-snagged" and "finish snagged" before being sent to the shop for machining. After machining they are taken to the paint room where they are cleaned with gasoline. This cleaning must be thorough so that all traces of oil, dust and chips are removed. Next, the castings are transferred to spray booths and sprayed with primer, as shown in illustration No. 1, at the top of this page.

Painting » »

BY FRANCIS A. WESTBROOK

▼ ▼ ▼

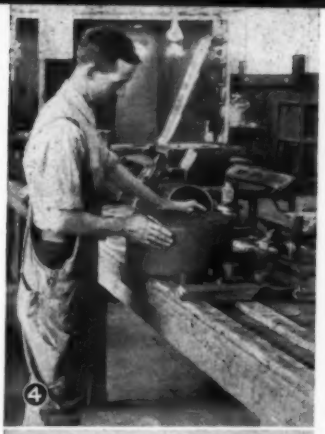
With the primer coat thoroughly dry, an application of filler is put on with a special tool, as shown in illustration No. 2. The purpose of this "knifed-on" coat of filler is to build up low places and produce a smoothly streamlined surface which ultimately will be as smooth as polished sheet metal. The filler coat must be allowed to dry thoroughly. Naturally it is thicker in some places than in others.

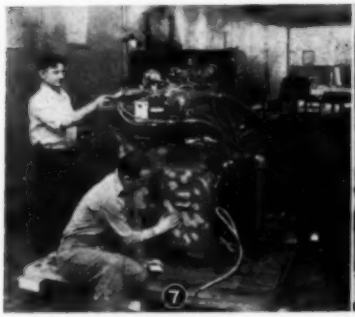
The dry filler coat is sanded by portable machines (No. 3) where possible, and by hand (No. 4) where it isn't practicable or convenient to use the machine. This careful sanding serves to further smooth the surfaces and prepare them for the sealer and final color coats of machine-tool enamel.

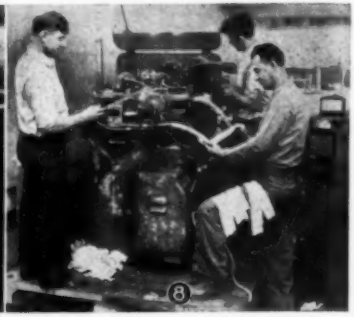
Incidentally, you will notice in illustrations 3 and 5 that heavy castings are placed in skids or lift platforms to facilitate easy movement from one place to another by means of lift trucks.

All inside surfaces, which do not ordinarily show, are sprayed with a coat of yellow crank-case sealer.

Over the smoothly sanded coat of filler a thin sealer coat is sprayed on, as pictured in illustration No. 5. This coating is machine-tool grey in color. When this thin sealer coat is dry the surfaces are sprayed with a full wet coat of grey enamel, which completes the painting job for all parts and sub-







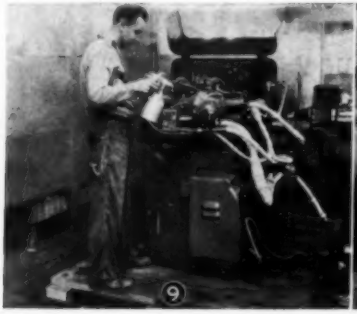
assemblies. These parts are then ready for temporary storage, shipment for replacements, or for immediate assembly into new machines.

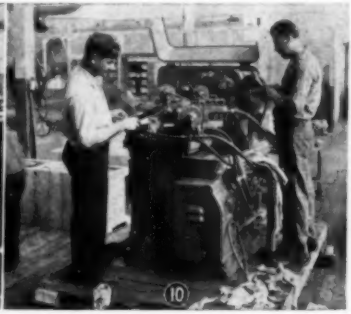
After a new machine has been completely assembled from painted parts, it will be more or less smudged with grease, oil and dirt, and at some places the finished surfaces will be scratched, bruised, dented or otherwise made unpresentable. This means that the entire machine must be cleaned; damaged places must be spot-puttied and spot-painted; areas not to receive paint must be masked; then it is ready to be given one or more all-over spray coats of finishing material.

Accordingly, the machine is carefully washed with a suitable cleaner and then blown with an air hose, as illustrated in cut No. 6. Damaged places are spot-puttied as exhibited in picture No. 7; then these places are sanded smooth and spot-painted.

Bright machined surfaces are "slushed" with suitable grease to mask them from the paint spray. Other parts are wrapped with masking cloth, as shown in illustration No. 8, to protect them from the final spray coats.

The last spray coats on the complete and masked machine generally include a thin sealer coat, followed, when dry, with a full wet coat of machine-tool grey enamel.





The spraying of the last coat is shown in cut No. 9.

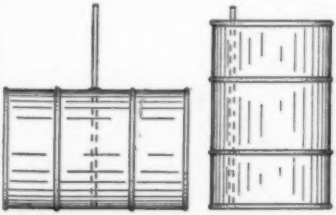
After this final spray coat is dry, the temporary slush coating is peeled off the bright surfaces with a putty knife, carrying with it the undesired paint coating. The cloth masking material is removed from other parts, as shown in illustration No. 10. The machine is now ready to be crated and shipped.

Measuring Material in Steel Drums

WITH this article are tabulated figures which show, with reasonable accuracy, the number of gallons of material remaining in a standard size steel drum from which some of the contents has been withdrawn. The gallonage remaining can be determined by measuring the depth of the liquid with a yard stick or any straight measuring stick.

The information is useful for general inventory purposes or whenever it is desired to make approximate measurements with a minimum of effort. For example, the stock room clerk can use this method for keeping a record of alcohol and solvent withdrawals, and also know his inventory at all times.

These charts were compiled from measurements of 188 and 190-proof alcohol in standard ICCC-5E drums (34⅞ x 24-in.). For similar liquids in drums of the same dimensions, the quantities listed on these charts will be found approximately correct.



Drum in horizontal and vertical positions.

With Drum in Vertical Position

Wet Inches	Temperature in Degrees F. 70°	60°	50°	40°	30°
31	53.5	53.8			
30	51.7	52.0	52.3	52.6	52.9
29	50.1	50.3	50.6	50.9	51.2
28	48.3	48.6	48.9	49.2	49.4
27	46.6	46.9	47.1	47.4	47.7
26	44.9	45.1	45.4	45.7	45.9
25	43.2	43.4	43.7	43.9	44.1
24	41.5	41.7	41.9	42.2	42.4
23	39.6	39.9	40.1	40.4	40.6
22	37.9	38.2	38.4	38.6	38.8
21	36.2	36.4	36.7	36.9	37.1
20	34.5	34.7	34.9	35.1	35.3
19	32.8	33.0	33.2	33.4	33.6
18	31.1	31.3	31.5	31.7	31.8
17	29.4	29.6	29.7	29.9	30.1
16	27.6	27.7	27.9	28.1	28.3
15	26.0	26.1	26.3	26.4	26.6
14	24.2	24.3	24.4	24.6	24.7
13	22.4	22.6	22.7	22.8	23.0
12	20.7	20.8	20.9	21.1	21.2
11	19.0	19.1	19.2	19.4	19.5
10	17.2	17.3	17.4	17.5	17.6
9	15.5	15.6	15.7	15.8	15.9
8	13.8	13.9	14.0	14.0	14.1
7	12.1	12.1	12.2	12.3	12.4
6	10.4	10.4	10.5	10.5	10.6
5	8.7	8.7	8.8	8.8	8.9
4	6.9	7.0	7.0	7.1	7.1
3	5.1	5.2	5.2	5.2	5.3
2	3.4	3.4	3.4	3.5	3.5
1	1.7	1.7	1.7	1.7	1.7

An ordinary yardstick is inserted through the bung so that the 1-in. end rests on the bottom of the drum. The stick is withdrawn and the number of wet inches shown on the stick is noted. This number is located on the proper chart under the column marked "wet inches". The gallons of liquid in the drum will be found opposite this number under the temperature which most nearly corresponds to the room or

With Drum in Horizontal Position					
Wet	Temperature in Degrees F.				
Inches	70°	60°	50°	40°	30°
20	54.3	54.7	55.0	55.3	55.6
19	52.1	52.5	52.7	53.1	53.3
18	49.7	50.0	50.3	50.6	50.9
17	47.1	47.4	47.6	47.9	48.2
16	44.3	44.5	44.8	45.1	45.3
15	41.2	41.5	41.7	42.0	42.2
14	38.1	38.4	38.6	38.8	39.0
13	34.9	35.1	35.3	35.5	35.7
12	31.6	31.8	32.0	32.2	32.4
11	28.3	28.4	28.6	28.8	29.0
10	25.0	25.1	25.3	25.4	25.6
9	21.6	21.8	21.9	22.0	22.2
8	18.4	18.5	18.6	18.7	18.9
7	15.3	15.4	15.5	15.6	15.7
6	12.3	12.3	12.4	12.5	12.6
5	9.5	9.5	9.6	9.6	9.7
4	6.8	6.8	6.9	7.0	7.0
3	4.4	4.5	4.5	4.5	4.5
2	2.4	2.4	2.4	2.5	2.5
1	0.8	0.8	0.8	0.8	0.8

air temperature where the drum is stored.

Example: A drum of alcohol stands in vertical position in a room where the air temperature is 28° F. The reading on the stick shows 18-in. By referring to the 30° temperature and the 18 wet inch columns, it will be found that the drum contains 31.8 gallons of alcohol.

Note: To obtain an accurate reading, the drum should be allowed to stand for several hours in order that the temperature of the drum contents will approximate that of the room or air temperature where the drum is stored. —U. S. I. CHEMICAL NEWS.

Infra-Red Baking

THE FOLLOWING information, in question and answer form, has been prepared by the C. M. Hall Lamp Co., Detroit, Mich., manufacturer and supplier of infra-red equipment for baking finishes.

1) Are infra-red and radiant heating the same?

Yes. All known heat sources produce infra-red, but only high temperature filaments deliver a large percentage of radiant energy.

2) Does radiant heat bake from the inside out?

No. Only in exceptional cases where pigments are translucent to infra-red energy.

3) Do air temperatures affect radiant heating?

Yes. Although air temperature does not affect energy delivered to the work, unheated air causes detrimental cooling and usually prevents a further temperature rise after five minutes.

4) Does oven humidity retard evaporation with radiant heating?

No. The air goes through a continuous cycle of heating and cooling, absorbing vapor as it is heated by the work and allowing it to condense in unheated portions of the oven.

5) Should radiant heat ovens be enclosed?

Yes. Enclosing will reduce both radiation and convection losses.

6) How do lamps for heating differ from lamps for lighting?

Ovens for synthetic enamels at high temperatures—that is 250°—were built this year with control humidity conditions inside the oven; this humidity being controlled by a sampling device which continuously takes a tiny sample of air from the oven operating through various relays to control the admission of steam to the oven interior.—R. C. Mahon Co.

Lamps for heating are operated at lower filament temperature and have different filament form.

7) Do open reflectors require frequent maintenance?

Yes. Regardless of the amount of paint fumes, loose dust and dirt will materially depreciate operating efficiency and consequent working temperatures.

8) Do heating service lamps burn out like lighting service lamps?

Ordinarily no. Their useful life is terminated by lamp blackening, mechanical failure or electrolysis because of extremely long-life characteristics.

9) Are low or high heat densities most efficient for general industrial applications?

Within the safe limits of the materials, the higher the heat density the greater the efficiency of heat transfer and the shorter the time cycle required.

10) Should heating service lamps be operated only on lighting circuits?

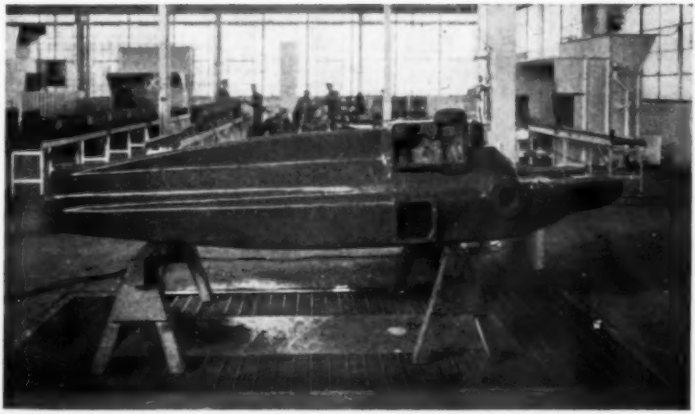
No. Provided sockets and other electrical equipment are properly designed, series parallel wiring may be used for direct supply from standard 220 or 440-volt industrial power circuits.

11) What is the maximum temperature available with radiant heat?

Most ovens are designed to operate at less than 400° F., although temperatures as high as 700° F. are possible with commercially available equipment.

12) Does radiant heating cause fading or other damage to paint?

No. Where finishes are designed for baking they will ordinarily stand even higher temperatures than under convection baking, due to the shorter time cycle.



Machine-tool painting—a heavy casting may be ground, sanded and painted over a safe metal grating in the floor. Grit, dust and fumes are immediately taken down through a water-wash spray booth for cleaning. This arrangement saves on floor space and also makes it easy to handle heavy objects.—Photograph, courtesy of Binks Mfg. Company.

Furnace Paint Shop; Old and New

PROBABLY most small shops that paint some of their product start in the painting process in a small way. This is especially true of such industries as the furnace business, where only in the last few years has painting been used. Since painted furnace casings at first constituted only a small part of the total number of casings produced, most of the equipment was assembled more or less piece-meal, and great attention was paid to holding down capital investment as much as possible.

Our paint shop is modern and fireproof.

As the proportion of painted casings increased, most firms added to or expanded their equipment to meet the needs of increased production. The result was more or less of a hodge-podge. When the operating and supervisory staffs finally learned from experience about the processes and problems involved in finishing, they began to realize the need for adequate and integrated equipment. But too often, considerable investment having been made, management was loathe to junk facilities just a few years old in order to replace it with new.

To the Farquhar Furnace Co. of Wilmington, Ohio, last October, came the opportunity to install entirely new painting and baking equipment as they wanted it, profiting from past experience with their first equipment. This opportunity came disguised as a disaster. A fire completely destroyed their old painting facilities.

When this firm started painting four years ago, they installed their equipment in a small wooden shed formerly used for storage. It was located in a lot adjoining the main factory building. A home-made oven was built in one end; a fan was set in one wall, and a spray gun and air compressor were put into use. As painted casings came to occupy a larger and larger proportion of their output the limits of this equipment, both as to quantity and quality of production, became more and more apparent. Several times discussions were held about the desirability of getting all new equipment and establishing a paint shop that would meet all current and expected needs for some time.

Then, on the night of October 21, 1940, the old wooden shed and all painting equipment was destroyed by fire. A replacement plan was leveloped at once. A new concrete-block fireproof building of much larger size was erected. Integrated equipment was installed, and what at first looked like bad luck is more and more taking on the appearance of good luck.—VERNON MARCONETT.

Despatch Oven Co. Increases Its Facilities

The Despatch Oven Co. announces increased manufacturing facilities at its plant at 622 Ninth St., S. E., Minneapolis, Minn. Manufacturing floor space of the plant has been increased 30%, and a great deal of additional machinery has been added so that production facilities have been tripled.

This increase in manufacturing facilities has been necessary because of the large volume of orders. About 50% of the present production is either directly or indirectly related to the National Defense Program.

Finishing Hardwood Caskets

BY AL MATLOCK

An expert finisher tells you what materials and methods he uses to put a fine finish on caskets made of walnut, oak, cherry and cedar.

WALNUT is our best seller in the hardwood casket line. Southern buyers seem to prefer a light but not a bleached color. They also prefer a satin finish rather than gloss, so this saves us no small amount of time and expense for polishing.

We use a combination stain and filler which, under ordinary conditions, dries to recoat in four hours. It is practically neutral in color but contains enough yellow to bring out the undertones of the wood.

I might say here that there is a world of difference in fillers, even though they may all be made by reliable manufacturers for the same purpose. We tried at least six before we settled on the one now in use. One shrunk badly, no matter how carefully it was applied. Another wiped "muddy". Still another settled so hard in the can that we thought we might have to use dynamite to get it out. One company submitted three samples and they all set up so quickly we had to wash off the filler with thinner.

Filler; Sealer; Lacquer

The material we now use (name on request) retains its creamy consistency much better than the usual filler, and it wipes easily, even after 30 or 40 minutes. In fact, even an inexperienced wiper can turn out a first rate filling job with it. After the filler has been wiped and is thoroughly dry the case is dusted off and brown lacquer shading stain is sprayed over the sapwood. This operation requires much skill; the tendency is to over-shade. Also, the stain must be just the right shade to match the adjoining wood, or it will have a painted appearance. Some finishers prefer to stain the sap with NGR (non-grain-raising) or water stain, but this slows up the schedule somewhat. With care, a good job can be done with shading stain, and the sealer can be sprayed directly afterward.

Sealers also differ a great deal. Although a high quality sealer may cost a few cents more per job, the difference in price is more than gained back in sanding time alone. After the sealer is dry (at least three hours; overnight if possible) it is sanded by hand with No. 240 abrasive paper, using a circular motion. The surface is sanded absolutely smooth. This operation is what "makes" the job.

The dust is blown off and now the satin lacquer is applied — a wet double coat to eliminate overspray

and sanding marks. In an hour or so the finish is hard enough to allow the casket to be sent through the trimming and lining rooms.

The insides of all the hardwood cases are sprayed with tinted drawer coater to prevent moisture from entering the wood. This is done between the outside sealer and lacquer coats.

The finish coat is medium flat, made with a gloss rubbing lacquer base, therefore if a polished casket is ordered it can be carried out as per schedule; then buffed and polished to a high gloss finish.

Golden and Fumed Oak Finishes

There is always a demand for oak caskets because the very term "Solid Oak" suggests strength and permanence. Most of these shells, both plain and quartered, are sold in a "fumed oak" or antique oak finish. Recently, however, golden oak has been forging to the front. The finish is in flat lacquer and the grain shows slightly, but it is not an open-grain finish.

We patch the cases, blow them off and fill the surfaces with a combination stain and filler that gives the correct shade for a golden oak finish. No water stain is used because of the bad grain-raising effect. I have never liked oil stain on oak because of its bleeding tendency and slow drying, and also because it sometimes seeps out after the wood is filled.

When the filler has dried (four hours or more) I spray the sealer and check over the shell for cracks or nail holes that got by the patching bench. These, if any, are fixed and the shell is sanded off carefully around the edges. Then the final coat of dull lacquer is applied.

If a "fumed oak" finish is desired, I take the filled casket and shade brown shading stain along the moldings. Then the sealer and lacquer coats are applied as usual, except that I put a little of the shading stain in the final coat to darken it somewhat. This is not a strictly "fumed oak" finish, as it was known in the old days (ammonia, shellac and wax) but this term has come into use for this particular shading effect and finish.

Nut Brown and "Breakfast-Set" Colors for Oak

"Nut brown" oak, also shaded, is considerably darker than fumed oak. The wood is wiped with dark oak uniforming stain, sealed and filled with black filler. Then the shading, sealer and lacquer are applied as on the fumed oak. Nut brown oak is sold largely in our northern territory. The southern buyer usually prefers light finish.

A few years ago we finished a number of oak cases in synthetic enamel, similar to a breakfast-set finish. The enamel was sprayed directly on the bare wood and allowed to dry overnight. Then the surface was filled with a filler of contrasting color; for instance, black enamel with white filled grain, beige with brown, grey with white, white with black, etc.

Strange as it seems, casket finishes follow the trend of the day. Several seasons ago, when "copper" was the prevailing color for women's clothing, there was a marked increase in copper finished metallic caskets.

Beige Oak Finish

This is an attractive finish for oak. It is easy to apply and answers the demand for the new honey-colored tones. Because there is no bleaching or staining, the job can be carried through from start to finish with only six or eight hours elapsed time in the shop.

The oak case is blown off and patched with quick-drying buff-colored putty. This material dries so quickly that the workman can start right back sanding down the putty with No. 180 abrasive paper. The surface is blown clean again and is now ready for filling.

While in the can the filler appears to be pink, but when it is applied on the work and has become dry it gives the wood a warm beige color. It is possible to recoat four hours after filling.

It is best to use water-white sealer over this filler to bring out the full beauty of the wood. We coat with sealer, sand the sealer two hours later, and coat with "satin lacquer" which is about half way between gloss and dead flat. If desired, two coats of rubbing varnish can be used as a top coat and polished out.

A large number of the beige caskets manufactured here are shaded with brown shading stain. If so ordered, I apply the stain under the sealer coat and proceed with the finish according to schedule. This number looks particularly good if bronze-plated handles are used, with copper high-lighting.

Rich Red Cherry Finish

Cherry is one of the most beautiful woods when finished properly. I have seen cherry furniture, exquisitely styled, daubed up with a muddy finish that completely spoiled the suite to a discriminating purchaser. With such a finish the wood might just as well have been yellow pine.

Our cherry caskets are sold in a polished, rich, red finish. The first operation, after patching, is the spray application of cherry non-grain-raising stain—at the same time blending the lighter streaks in the wood so that the color will be uniform. After two hours the case is sanded down lightly with No. 400 abrasive paper, and a coat of mahogany uniforming stain is brushed on. A little walnut paste filler is mixed in with this stain. This mixture is wiped off clean and what color is absorbed by the wood remains. The stain-filler also fills the pores in the wood and holds out the succeeding coats.

After the stain dries overnight the sealer and gloss lacquer are applied in the conventional manner and polished out.

Cedar Finish Must Have Luster

Cedar caskets are the simplest shells we have to contend with, although there is quite a bit of patching to do on them. They are made from native "hill-country" timber with plenty of knots. Knotty cedar is a beautiful wood, but it chips badly under the planer and all these chipped places must be filled and sanded.

A brick-red putty is used on the red parts of the wood and tan-colored putty is used to patch the light sections.

After the patches are sanded, the shell is sprayed with a coat of thin orange shellac. This acts as a sealer to hold in the natural oils of the wood. It also imparts an amber tone to the light streaks in the cedar and gives it an aged appearance.

The shellac coat is lightly sanded after drying overnight; then the shell is sprayed with lacquer sealer. Two hours later, and after a quick scuff-sanding, the gloss lacquer is sprayed on—a wet double coat. The casket may be polished out the next day.

Cedar does not look attractive in a dull finish. The first one we made was sprayed with satin lacquer and everyone was disappointed with it.

I had it rubbed out and it looked like a different casket. One of the millroom hands saw this casket and paid me the compliment of saying, "How do you make it look like there was a sheet of glass over the wood?"

Telephone Booth is in Bleached Mahogany

A NEW telephone booth that is wholly streamlined in design, with several improvements in comfort, beauty, and sanitation, has just been created by the Churchill Cabinet Co., of Chicago, Ill. It is of latest folding door type and is fashioned of solid bleached mahogany and mahogany plywood, its design being one of absolute simplicity so that the wood's honey tone shows to advantage through the rubbed lacquer finish. All corners are smoothly rounded, including those of the telephone shelf and seat within.

A really revolutionary departure from former styles is presented by the booth's interior, which is entirely lined with plate glass. Not only is this highly decorative, but it makes the booth more soundproof. With the glass interior, there is no problem of wall defacement.

The glass is held securely in place by chrome plated moldings at the corners. In the folding door, which doubles back from the center to open easily, are full length, full vision beveled panels of plate glass. Further sound-proofing efficacy results from the use of sound-absorbent material in the ceiling, finished in white for light reflection.

Other features include a revolving electric ventilator in the ceiling. This operates automatically with the closing of the door after a patron has entered the booth, and keeps the air in constant circulation. An electric light turns on when the door is shut. The booth sets firmly on the floor by means of a metal frame base so no extra floor is needed.—T. WALLACH.

Finished attractively in bleached mahogany.

United Lacquer Moves Its New England Division

The United Lacquer Manufacturing Company's New England Division has moved from 114 Broadway, Cambridge, Mass., to larger quarters at 78 Freeport St., Boston, Mass. The new telephone numbers are Geneva 1440-1441.

Pin Holes . . . and Filling

AS APPLIED TO PRACTICAL WOOD FINISHING

BY F. W. WORTH

What causes pin holes and how to prevent them. Also the selection, mixing, application, rubbing and drying of filler — which is really the foundation of attractive and durable finishes on wood surfaces.

THE problem of pin holes is one that has appeared in every wood-finishing room in the country, I believe.

What is a pin hole? Is it an open pore or partially open pore in a finished wood surface.

How can it be remedied? You can remove all danger of having pin holes by properly mixing and applying a good quality of filler. Filler for wood surfaces should be mixed not heavier than in the proportion of 8-lbs. to 10-lbs. of filler to the gallon of naphtha or thinner specified by the filler manufacturer.

How should filler be applied. I recommend brushing it on, stroking the brush with the grain and then brushing across the grain of the wood. But first, see that no dust particles, either loose or imbedded in pores of the wood, are present to offer a hindrance to the filler getting into the pores.

When filler is brushed on as just suggested, the mixed filler runs into the open pores of the wood. Let this dry until it shows a flat appearance. Then scuff off the surplus, using a pad made of tow, and working across the grain. This material (tow) is soft and can be formed into a pad and used on several pieces before it is discarded. Clean the filled surface by rubbing with the grain afterwards, using a soft cloth that leaves no lint particles. If this procedure is carefully followed, there need be no danger of pin holes ever showing up after the filled surface has been coated.

Hazards in the Filling Department; Cheap Help

One of the worst filling department hazards is the class of worker that is generally picked for the job of filling. Usually it is someone who has learned no trade at all, knows absolutely nothing about finishing, and cares little if anything about the results after the work leaves him. Of course, the foreman may be partly to blame for this, as he should not have a man of this type in his department. On the other hand it may all point right back to the company executives. They may not realize how important it is to have real workmen on this kind of work and therefore will not allow the foreman to pay

enough to get suitable men for the job. It is "tough" when a foreman has to get along with cheap help.

Brushing on and wiping off filler is not a very pleasant job. It is not such clean work and the odor is not so pleasant either. Nevertheless, correct filling is the one operation that makes the real foundation for a satisfactory finish on wood surfaces.

The Proper Filler To Use; Importance of Checking Operations

When selecting a filler for any particular type of finish on wood, it is essential to get in touch with some reputable wood-finishing material manufacturer. Such an organization will know, after making a study of your particular work, just how to go about furnishing you the best material for the job. The company has men who do nothing else but make a study of troubles that turn up, and they are equipped to give good service.

It is important to keep close watch on drying conditions and the working qualities of your mixed filler at all times. For instance, on a dry day when the filler has a tendency to dry quickly, it may be necessary to add a small portion of linseed oil to a batch made up, so the filler will dry more slowly and allow the operator sufficient time to clean the filled surfaces. Otherwise, the filler may dry so fast that it will be practically impossible to get a satisfactory filling job. At the same time you may get a mussy and streaked effect because of too rapid drying.

On days of high humidity, with excessive moisture in the air, there may be no occasion to add linseed oil to the filler. It may be just right, as mixed originally with naphtha. It is apparent, therefore, that any foreman finisher who depends on an operator on the job to mix his own material, and doesn't check closely on all conditions affecting the work — this foreman may be put to a lot of finishing trouble.

Explanation of Pores in Wood; How to Fill Them Properly

A natural pore in wood, put under a microscope, will show that it is approximately the shape of a V in cross section. When filler is mixed in the proper consistency and when the wood surface is clean, as mentioned previously, the filler will flow into these pores and fill them from the bottom to the top—like liquid ice cream fills a cone.

If a filler is not mixed to the proper consistency (and there are many finishers who still believe in this wrong idea) that is, if it is mixed and used too "heavy" and then brushed on, it cannot run into the wood pores. Accordingly, the finisher has to take different steps in an attempt to force the filler into the pores. He pads it while it is wet, forcing some filler into the enlarged upper portion of the pores. This procedure is wrong. The results are added labor, a poor job of filling and, eventually, pin holes.

When "heavy" filler is forced this way it never really gets to the bottom of the pores. It is like hard ice cream in a cone—there is filling at the top and part way down, but not clear to the bottom. An air chamber remains at the bottom of the pore and, this is where trouble originates. The naphtha and oil, along with any excess moisture that might be in the wood, form gas at the bottom of the pore. Eventually this formation of gas forces its way up through the filler, thereby causing a pin hole. Sometimes this formation of gas does not come out until the wood surface has been

coated with shellac or sealer; sometimes not until the last coat of finish has been applied.

Lumber; Air; Conveyor Finishing

There are cases wherein a filler problem might even be traced back to the lumber kiln. If the lumber was not properly dried and therefore contains excessive moisture, this could cause gas to form in filled pores. It would cause pin holes to form, even if the filler had been applied properly.

At one time, many years back, when spray equipment first came into prominence, it was thought by some that air from the spray gun was causing pin holes, but this was not the case at all.

There is now on the market, manufactured by most wood-finishing manufacturers, a wood filler for speed work on conveyor systems, where every operation is timed and where the filled work passes through drykilns especially adapted for the particular filling job being done. This material, of course, should be recommended and adjusted to the required time, etc., by experienced engineers.

Danger Signs; What They Mean

Here are some of the danger signs which show that filler is not working properly or has not been mixed as it should be: A surface, after being filled, shows sweating pores or oily spots. This means that too much oil has been added to the mix. In cases like this the filler should be readjusted by using a good japan drier to offset the excess oil.

Another indication of trouble appears when the pores turn grey. This is usually caused by the repeated addition of thinner or naphtha to the mix, after letting the mix stand over night or for a day or more. Naturally, after standing for some time, the mixed filler becomes "heavy" or "thick." Naphtha is then added to bring it back to brushing consistency. This washes out the color which, in turn, causes the grey appearance in the pores.

Still another bad effect shows up when a filler is not mixed correctly or when it is not made up properly in its original form by the manufacturer. When the surface is coated with lacquer sealer or lacquer, the filler raises in the pores. After drying (thorough drying is vitally important) it shrinks back to its normal level surface, but later when the surface has been rubbed and dried out thoroughly, the filler shrinks still more in the pores and hair-line checks appear. In most cases of this kind, the trouble can be traced back to the filler, or to improperly dried lumber.

Moisture in wood, if not properly adjusted, can and does cause much secret trouble in the finishing department; therefore, as a final word on this subject, I should like to emphasize that the filling department in the finishing room needs more attention, both in regard to materials and labor.

Maintenance of Hand Fire Extinguishers

FIRE extinguishers, to be instantly available for use at all times, must be properly recharged and inspected. The date of recharging should be noted on the tag provided for that purpose, along with the name or initials of the man doing the work.

Fire insurance underwriters recommend that only recharging materials and replacement parts furn-

ished by the manufacturers of the extinguishers be used in service work. Full instructions for recharging the various types of extinguishers are given on the labels and they should be followed to the letter.

When the 2½-gallon units are recharged, all parts should be washed thoroughly in water and the water drained through the hose. The shell should be examined to make certain it is sound at the seams, for, after all, it is a pressure container. The headgasket and hose should be examined for signs of deterioration, and the strainer should be cleaned.

When the cap is screwed back on the shell, the worker should make certain that at least four threads are engaged. A small amount of vaseline may be placed in the threads to make the task easier and facilitate removal for the next recharging.

All chemical solutions should be mixed in clean containers and not in the shell of the extinguisher, and the container should be carefully rinsed before being used for a new solution.

Only liquid obtained from the manufacturer should be used in the vaporizing liquid type extinguisher. The use of commercial carbon tetrachloride, which may contain some water or chemical impurities, is likely to damage the interior of the extinguisher or, if used on live electrical equipment, endanger the operator.

Directions for inspecting and recharging various types of hand extinguishers are as follows:

Soda-acid: Recharge annually. If exposed to temperatures below 40° F., place in suitably heated cabinets. Do not mix anti-freeze crystals with the solution.

Foam: Recharge annually. Anti-freeze ingredients should not be added to the solution; if exposed to temperatures below 40° F., extinguishers of this type should be kept in suitably heated cabinets.

Vaporizing Liquid: Recharge after use and keep unit filled at all times. Test action of pump by discharging a portion of the liquid into a clean, dry container. The test liquid can be poured back through the filler opening. Guard against overfilling. No lubricants should be used on the piston of this type of extinguisher, nor should any water be placed in it.

Loaded Stream: Recharge after use; inspect annually to see if container is filled and that hose and gasket are in good condition. Weigh carbon dioxide cylinder and replace it if it has lost ½-oz. Extinguishers of this type may be exposed to temperatures as low as 40° below zero F.

Carbon Dioxide: Recharge after use; inspect annually to note if seal is intact. Weigh the unit to make certain weight is equal to

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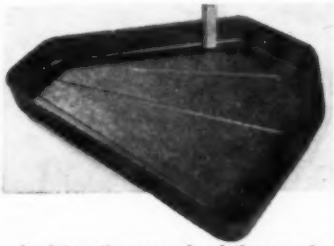
One of the biggest advances of the year was in masking tape, an improvement probably brought about by the increased use of 2-tone finishes for automobiles. A year ago we were warming our tape over steam coils so it would unroll. In hot weather the tape left a gummy residue. In any weather an edge came loose now and then, letting the paint blow underneath. Recently I got a roll of the new thin "wet-or-dry" tape, and now I wonder how we ever got along without it. Every finisher should give this tape a try before he orders any more of the old type.—Al. Matlock.

that stamped on it. Loss of 10% in weight indicates the need for recharging.

Anti-Freeze, Pump Tank: Recharge after use; inspect annually to make certain it is filled to filling mark. Test pump action by operating pump for several strokes, directing stream back into tank.

Anti-Freeze, Other Types: Recharge after use; inspect annually to see if container is filled and that hose, gasket, etc., are in good condition. If carbon dioxide is used for pressure, loss of ½-oz. in the weight of the cylinder is cause for replacing it with a new one.—SAFETY RESEARCH INSTITUTE.



An interesting example of the use of a special zinc-coated sheet metal is the fuel reservoir fabricated by the Chattanooga Stamping & Enameling Co. for use in refrigerators. The high grade zinc coating of the 20-gauge Armco Zincgrip Paintgrip sheets easily withstands the severe forming operation without peeling or flaking. A special bonderized finish, united with the zinc coating in the steel mill, provides an excellent neutral surface for paint.

The foreman of Chattanooga's stamping room reports that only a soapy water solution is needed to prepare the sheets for the dies, in contrast with the graphite and oil lubrication required before these special sheets were adopted. The soapy water solution prevents scratching of the dies and breakage of sheets, and is easily removed afterwards. When completed, the reservoir pans are 26¼-in. long, 19¼-in. wide at the widest point, and 3¼-in. deep.

Fast Furniture Schedule Without Force Drying

RECENTLY I had an opportunity to observe a fast finishing schedule in a factory making a medium grade of novelty furniture. One operation, in particular, seemed to me to be all wrong. It was the short time allowed to dry their filler. In spite of this, however, the finished article looks good and also shows a fairly tough finish. The complete finishing schedule is accomplished without any force drying. The average room temperature is about 75° to 80°F., with satisfactory natural ventilation.

Their complete finishing schedule is as follows: The articles are sprayed with a non-grain-raising stain and then allowed to dry for 30 to 45 minutes. Next a coat of a good grade of lacquer sealer is applied, the sealer being reduced four parts of sealer to one part of reducer.

After about 30 minutes the surfaces are sanded and the parts that need filling, such as tops and shelves on end tables and coffee tables, are filled with a regular overnight filler that has been reduced with V. M. & P. naphtha to the regular consistency of about 12 to 14-lbs. of filler to one gallon of naphtha.

Now the part that puzzled me and which I thought would cause them trouble is the short drying time allowed for their filler. The filler has only from 30 to 45 minutes drying time before they spray one more coat of the same sealer—not reduced like the previous coat, but full body—over the apparently wet filler. This coat dries about 45 minutes to one hour. Then, after a thorough sanding, a coat of a heavy solids 27% lacquer is sprayed on.

Most of the goods are rubbed and

polished the same day. They use a wet-or-dry abrasive paper for rubbing down, and polish with rubbing and polishing compound.

One would naturally think that the finish would be brittle and that the adhesion of the lacquer coats over the filler would be poor, but this is not noticeable any more than on pieces that have a slower schedule and more drying time for the filler.

I believe that probably the chief reason for the satisfactory finish they obtain is due to the fact that their filler is sandwiched between two coats of good lacquer sealer. In this way their first coat of sealer, sprayed directly over a fast-drying non-greasy stain, gives them good adhesion on the open-grained wood; and in filling, the liquids in the filler can not penetrate into the wood as it would if the filler were applied on the bare or unsealed wood surfaces. The small quantity of oily liquid that is absorbed into the wood will destroy all adhesion if it is not dried out thoroughly before sealer is sprayed over the same.

The second coat of sealer over the filler, seems to "bite through" the filler and into the first coat of sealer, and therefore forms a perfect bond on the wood, consequently it produces a satisfactory finish regardless of the short drying time for filler.

I also noticed that their completed finish did not show any more shrinkage than was in evidence on pieces on which the filler had dried overnight.

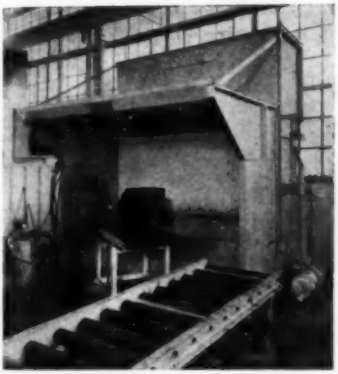
Although I would not recommend the foregoing schedule for use on high grade furniture (I still believe the regular overnight filler should be either force dried or have a longer drying period, say overnight for best results), it is evident that one can get fairly good results and a satisfactory finish for the cheaper and medium lines of furniture, if this process is followed. — FERD ROSEN.

Our theme for next year, "Step It Up in '41," is based on the conviction that this year's sales gains in refrigerators, ranges, and other appliances will continue with increased force in 1941. Increased employment, with its resultant larger payrolls, will increase the purchasing power of millions of families, affording them the opportunity for comfort, convenience, and labor saving in the home through household electrical appliances.—Westinghouse.

Comments on Art of Color Patching

REFERRING to Mr. Emerson C. Martin's article about "The Art of Color Patching," starting on page 22 of December 1940 issue, there is little can be added to what Mr. Martin has written except to mention that each individual uses a different size pad in rubbing. Cutting the cheesecloth to small sizes was fine for the French polishing method, where you used cotten batting to make a round ball, but I find it a great advantage to make a pad from a square piece of cheesecloth about a yard square, folded to fit the hand. If this is too large you can cut to suit, and get the right feel so as to avoid strain and tiring. Too small a piece can tire one quickly. The quality of cheesecloth means a lot, as the better quality and closer woven material makes a better pad, and it lasts longer.

My work covers everything in the trade. That is my reason for



Machine-tool painting . . . . an interesting application of a portable or broken-line conveyor in front of the water-wash dynaprecipitor spray booth. When the heavy casting has been completely painted, the turntable is rolled into position and the casting is rolled off on the roller conveyor. Photo, courtesy of Binks Mfg. Co.

using a pad of the size mentioned.

Mr. Martin would find it to his advantage to use one of the blocks of stain, made in lump form, for rubbing over bare edges when he does small pieces. These blocks can be purchased from any of the supply houses. Also, another product for building up the finish (which is very fast but you have to watch for wrinkles in too much rubbing) is called "Re-Nu."

I believe men who purchase the material as I do, have a much better chance in finding more things for the trade than the man who just works in the factory, but men like Mr. Martin, with the will and the way, can always find these things.

There is nothing better than amalgamator or amber glaze for taking the color. I find, as my experience increases, that I am using less of the rubbing varnishes now than I did a few years ago, and doing more work.

* * *

Regarding "Glue Stains in Veneered Work," as published on pages 63 and 64 of December 1940 issue, I have had some experience in doing this work and these veneers were always sized. On curly maple, the face side was thoroughly rubbed over with chalk, then covered with paper before the glue was applied on the other side—and glue was always put on thin.

Trusting you will accept this in the interest of the trade with the good will given.—GEO. D. WATT.

Dernell Named Southern California Manager for Ault & Wilborg

William H. Dernell, associated for 20 years with the Ault & Wiborg Corp., has been named district manager of Southern California for A & W, with offices in Los Angeles.

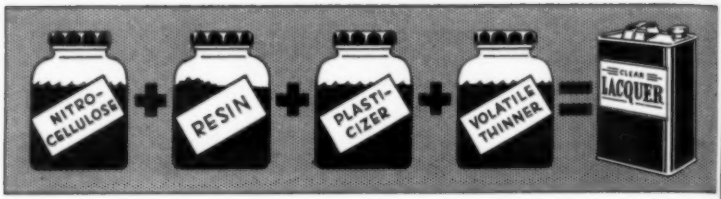
Prior to his connection with A & W, in the early days of the airplane industry, Mr. Dernell was associated as an aeronautical engineer with Curtis Airplane Co., Boeing Airplane Co.,

Wm. H. Dernell, District Manager of Southern California for Ault & Wiborg

and Whittemann Aircraft Corp. After leaving college, he practiced civil engineering for several years, and then joined the staff of Thomas A. Edison as production manager of cabinet manufacturing.

Mr. Dernell joined Ault & Wiborg as an industrial engineer, later becoming manager of the Cincinnati plant. For a number of years he has handled sales activities, more recently having been manager of the Buffalo district.

A & W has operated on the Pacific Coast for 45 years.



Clear Wood Lacquers . .

OF ALL types of lacquers sold today for industrial use, clear wood lacquers probably exceed all others in volume. Five years ago this statement might not have been true, for the automobile industry then used tremendous quantities of automotive lacquer enamels. But now the situation has changed. Synthetic baking enamels are being used on almost one half of all the cars produced in this country.

This fact is not important to the subject of this article, but it is important to the lacquer manufacturer as well as to the industrial wood-lacquer consumer, since it is the latter who benefits most by the best sales and research effort of the former. Wood lacquers are constantly being improved in quality. The question is, therefore, *what quality can I get for my wood finishing dollar?*

Of course, to understand better what you are buying when you place your order for clear wood lacquer, it is necessary to know approximately what goes into the making of this material. Most lacquers contain nitrocellulose, resins, plasticizers, volatile thinners and, if they are sanding sealers or flat lacquers, they also contain pigments. Each of these ingredients contributes its properties to the quality of the final finish as follows:

Nitrocellulose gives the lacquer hardness and toughness, makes it dry quickly and contributes to film strength.

Resins give the lacquer adhesion, gloss and fullness. They also increase the solid content of the material so that more of the lacquer remains as a film on the article being finished, and less evaporates as solvents into the thin non-profit-making air. They also have a tremendous effect upon the durability and lasting qualities of the lacquer, depending on which of the many possible resins are used and also in what quantities they are used. Some resins will increase durability while others actually decrease it.

Plasticizers are used to give the film flexibility. They protect the film from cold checking by making it elastic to temperature changes. They also contribute greatly to the gloss of the dry film.

Volatile Thinners are used to dissolve the nitrocellulose, resin and plasticizer in the preparation of the liquid lacquer. They enable the lacquer to be sprayed freely, after which they evaporate and deposit the soluble ingredients to form what we call the dried lacquer film.

BY PAUL WALLACE
Lacquer Chemist

An experienced lacquer chemist tells you what is in clear wood lacquers, what the usual price ranges are, and what enters into the formulation of these materials to make their prices, performance and durability different, although first appearances may indicate little if any difference. Here is your range of available materials. Name your price and you can have it—but you owe it to yourself and to your business to know exactly what you are paying for and getting.

They normally do not affect the strength of this film, but they can and do affect its appearance. *Orange peel, flow and gloss are controlled by the types of solvents (mixed solvents are called thinners) used in making lacquer.*

Pigments are used in sanding sealers as an aid to the sanding operation, and in clear flat lacquers whether they are known as semi-gloss, semi-flat, flat or dull. They contribute very little to the properties of a well balanced lacquer besides ease of sanding or lowering of surface sheen, and consequently will not be mentioned in the discussions of the various types of lacquers which are to follow.

These are the normal ingredients in the average wood finishing lacquer. The quality of this lacquer will therefore depend on: 1) the quality of each of these individual ingredients; 2) the relative amounts or percentages of these ingredients in the finished lacquer; and, 3) the skill with which these separate ingredients were combined.

We shall not be far wrong if we assume that all reputable lacquer manufacturers combine their lacquer ingredients with the utmost skill and care—of which they, collectively, are quite capable. Therefore, the two remaining factors of quality and amounts of individual lacquer ingredients are what we shall use in the evaluation of those lacquers which can be obtained in the following price classifications.

The Low Price Range; 60c to $1.00 in Drums

This class of wood finishes has, in the past several years, been in increasing demand by the novelty furniture and chair industries. Few items in this group can be used for high quality furniture, since they are designed primarily for certain types of low cost finishing jobs. They should be used strictly in accordance with the directions of the manufacturer who knows not only exactly what these finishes will do, but more important, what they will not do.

Cheap lacquers are made by two different methods. The first of these is by taking advantage of the relatively low cost of thinners. Such lacquers usually contain about 10% to 15% solids, which are composed of high quality nitrocellulose, resins and plasticizers, and about 85% to 90% thinner. Thus, by using small amounts of expensive film-forming ingredients and large amounts of solvents, it is possible to make cheap lacquers which give films of high quality but of low build.

Such low-build films are not suitable for top coat work because they do not give the fullness necessary for sales appeal. They do, however, make excellent sealers since their high quality gives an excellent bond between the wood and the final finishing coat or coats. This is an important point in favor of this type of lacquer because cheap finishes can be improved by using good sealers, just as good finishes can be spoiled by using poor quality sealers.

Inexpensive Gums Used, But They Give Depth and Gloss

The second method of making cheap lacquers is to incorporate relatively large amounts of the more inexpensive types of gum and resin. This does not necessarily mean that these resins are of poor quality but rather that they are either easily and inexpensively manufactured or are naturally abundant. While it is true that these resins do not have all of the desirable characteristics of the modified alkyd type resins, which are found in the more durable and expensive grades of lacquers, they are nevertheless quite suitable for finishes which are to be applied to novelty furniture and the like.

Since these more inexpensive resins have a much lower body or viscosity when "cut" in lacquer thinners than the body which nitrocellulose produces in the same thinners, the finished lacquer at spraying viscosity will usually have a high solid content. Ordinarily this solid content will range from 25% to 30% and occasionally up to 35% at the gun. Therefore, these high building lacquers produce, in one or two coats, a tremendous amount of fill, depth and gloss.

Because they do produce such heavy lustrous films, it is well to remember that they are especially made to do this in a minimum number of coats—certainly not more than two coats over the sealer. For this reason it is unwise to use these types of finishes in three coats or more, since the heavy coatings produced will take a longer time to dry and may induce printing or pack-marking troubles.

A Step Higher in Price; $1.00 to $1.40 in Drums

Lacquers at or between these two figures represent the quality group of low cost finishes. Essentially they are similar in general composition to the high-build finishes of the $1.00 or less class, in that they contain relatively large proportions of resins to produce films of high

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solid content. Actually, however, they do represent an improved quality of material and ingredients which justify their increase in price.

The principal difference between this low cost "quality group" and the lowest priced group is one of greater adaptability and performance. Whereas the lowest cost group is designed principally for use on novelty work and low priced chair goods, these better grade finishes may be used almost universally. Radio cabinets, clock cases, wardrobe furniture, end tables and upholstered chair frames are but a few examples of their use.

Where the Difference Is

What then, one might ask, are the reasons for these differences in use and performances? There are many such reasons, of which any one or a number may apply to any particular lacquer. First of all, better quality and more expensive resins are generally used. The finishes are therefore more durable, can be rubbed and polished to a high or dull luster as desired, are more cold-check resistant, and dry faster with less danger of printing or pack-marking.

Just as there are differences in types of resins, so there are differences in plasticizers. Better grade finishes contain better grade plasticizers. Since plasticizers, as mentioned earlier, give the lacquer film flexibility and elasticity, the better grades of plasticizers are retained more permanently in the film, thereby increasing greatly the life and protective qualities of that film.

At this point the question might well be raised: "Well, after all, isn't a resin just a resin and aren't plasticizers pretty well standardized?" The answer to both is emphatically "No!" There are literally thousands of resins and hundreds of plasticizers that can be used in making good wood finishes.

Modern chemical research is continually producing new products and raw materials, and the progressive lacquer manufacturer is constantly testing and experimenting with these products in order to improve his lacquer. Therefore, if your lacquer contains a better resin or a better plasticizer, you may rest assured that you are using a better lacquer, and that the difference in price between 90c and $1.25 is not just profit for the manufacturer.

The High Quality Price Range; $1.40, $1.50 up to $3.00 in Drums

In this group are found some of the highest quality wood finishes which it is possible to manufacture. These lacquers usually contain from 21% to 27% non-volatile solids and have generally the following compositional characteristics: First of all they usually contain relatively high proportions of nitrocellulose, which produces great toughness and strength of film. Secondly, while resins are used with this nitrocellulose, they are not used in such large amounts as in the lower priced lacquers. In addition, they are of the finest quality types, exceeding all others in qualities of permanent durability and beauty of finish.

Third, and probably most important, is the fact that greater amounts of plasticizers can be incorporated in these "high nitrocellulose" lacquers without producing unduly soft films, as would be the case in "high resin" lacquers. Therefore these finishes can contain enough of these essential plasticizers to produce permanent flexibility and life in the lacquer film. Such lacquers are used on the finest of cabinet work, such as pianos and

high grade furniture, where the life expectancy of the finish is frequently in excess of ten years.

Fourth, these lacquers contain some of the finest thinners and solvents. While it is true that thinners evaporate into thin air and are not a part of the final dried film, they do have an immediate bearing on the type of film that is produced. More important, they determine to a great extent the ease with which the final result is obtained. For instance, a good lacquer thinner will insure freedom from blushing under the most severe weather conditions, making it unnecessary to have to use retarders in wet, humid weather. Furthermore, good thinners produce better flow, do not "bridge", and eliminate all pinholing troubles, thus making it easier to rub and polish to a perfectly level surface, as well as giving a better appearance to satin or rubbed-effect surfaces.

Tops in Price per Gallon; $3.00 and over in Drums

These lacquers are not used very extensively because of their high price. For such applications as furniture finishing and the like, the relatively large quantities of material required per finished piece would make the finishing cost prohibitive.

On certain types of work, however, it is desirable to obtain a celluloid-like coating in as few applications as possible. This is very well illustrated by the types of finishes applied to some of the highest grades of tennis rackets. The pieces are relatively small and require correspondingly little lacquer for coating. On the other hand, these coatings require a good deal of hand work such as buffing, to produce surfaces similar to laminated sheeting. Therefore, the more that can be obtained from such a lacquer per coat, the less the number of applications and the less the amount of buffing necessary to produce the desired effect. For this reason, *lacquer costs are relatively cheap if the best that can be obtained will eliminate much of the after work.*

These lacquers are not necessarily higher in quality of film than those selling for $1.40 and $1.50, but they are usually higher in solid content, running 30% to 35% at the gun. Of course, lacquers of similar content can be obtained for $1.00 or less, but it must be remembered that these finishes contain large amounts of low priced resins. The premium priced, high-solid lacquers on the other hand, contain high proportions of low-viscosity toughness-producing nitrocellulose. They are pale in color, tough and flexible, have unusually good outdoor durability, can be buffed to a high luster and have good wear resistance. They are highly specialized finishes and are economical to use only where unusual conditions of application, after-treatment or after-use apply.

Shellac Information Bureau News

Mr. Gordon Obrig of the Industrial Design Department, Pratt Institute, Brooklyn, N. Y., has been retained by the Shellac Information Bureau to assist the engineering firm of Barsky and Strauss, Inc., in research work and trade investigations with respect to the growing use of shellac.

Bakelite Opens St. Louis Office

Bakelite Corporation, Unit of Union Carbide and Carbon Corp., announces the opening of a varnish resin sales office at 4228 Forest Park Boulevard, St. Louis, Mo. E. L. Metcalf has been appointed in charge and will render technical service to the South and Southwest territories in connection with Bakelite synthetic resins for protective coatings.

The First Real Competition fo

Spede-Var combines all of the advantages of varnish as well as the quick drying toughness, and durability of lacquer.

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2. Packing in 1 hour . .
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9. MAR RESISTANCE

We invite you to use the attached post card at once in order to get complete details on the savings which Spede-Var makes possible.

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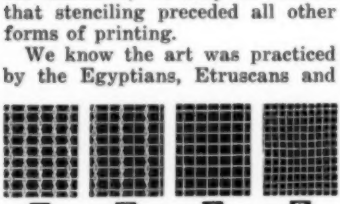
Stencil Screen Printing

Explaining the grades, mesh and weave of silk, organdy and wire cloth for use in making stencil screen plates. Also details of wood frame construction and how to stretch and hold the cloth.

BY HARRY L. HIETT
Prairie State Products Company

FOR many centuries methods of stenciling have been in use and well known to decorators. While there are no means of long-distance diagnosis, other than information gleaned from libraries and historical museums, we may be certain that stenciling preceded all other forms of printing.

We know the art was practiced by the Egyptians, Etruscans and early Chinese for decorating and printing walls, metals, ceramics, textiles, coats of arms, genealogical charts, and playing cards—the latter of which were more exquisitely elaborate than our present standardized deck.



Enlarged views of the mesh and weave of materials used for making stencil screens.

A—Bolting cloth (full-gauze weave). The warp threads, it will be noticed, are double, with an interlocking twist at the intersections, preventing shifting of the threads. This is made in numbers up to 12 only, and is the most expensive of all mesh materials, excepting wire cloth.

B—Bolting cloth also (half-gauze weave). The interlocking twist can be noticed on every other strand. Half-gauze weave is made in all numbers up to 25. This weave is necessary in the finer silks, which would otherwise be closed, if a full-gauze weave were used.

C—Stencil silk (taffeta weave) comes in numbers 6, 8, 10, 12, 14 and 16. Mesh count is identical to that of the better grades of bolting cloth. Organdy voile is also of the straight taffeta weave.

D—Stencil organdy (basketweave) irregular. The mesh count in the different qualities varies and is equivalent to 6, 8, 10 silks. It is low in tensile strength, but is used for printing of competitive items.

Stenciling was first introduced into America just before the Revolutionary period. It was used for decorating furniture, bric-a-brac and some woven materials in the then popular "Liberty" motifs. There is also some evidence that the Aztecs and Pueblos used stenciling, in combination with free-hand decorating many years before.

The Chinese used a tieless stencil from the latter part of the 18th century on. Several of these are included in my personal collection. These were made by laminating human hair between two cut rice-paper stencils. The color medium was applied by stippling, brushing or rubbing, but not by squeegeeing. Contrary to some hearsay, the stencil screen process is strictly an American innovation.

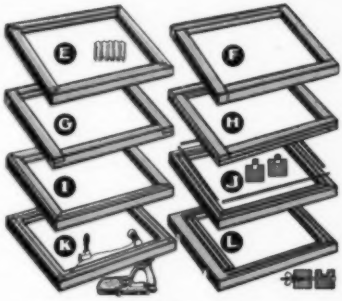
Being a pioneer in the process, almost from its inception, and having written several books on the subject, this writer has exercised quite an important part in its development. This includes its crude and limited beginning (felt pennant printing) on up to its present diversified proportions, from which a new and fast growing industry has been created. The simplicity and low cost of the process are features that have made it attractive, even to those with limited means.

There are approximately 40 different adaptable means that can be utilized in the preparation of the stencil-screen plates, involving various mesh materials and masking-out mediums, including photographic. After the stencil-screen plate has been made, the actual printing, printing colors, equipment, etc., are secondary; therefore, for any particular job, the selection of the proper kind of mesh material that enters into the stencil-screen plate assembly is of first importantce.

Silk Bolting Cloth; Taffeta Weave, Stencil Silk

Made in Switzerland and France, primarily for milling purposes, and imported duty free, this material was first used for stencil-screen work in 1908. It was quite an improvement over the previously-used treated cheesecloth. There being no manufacturers of the material in this country prior to 1938, the U. S. Treasury Dept., Bureau of Customs, nevertheless did, in 1929, except bolting cloth (for purposes other than milling) from the privilege of free duty. This duty has advanced steadily until the price became rather objectionable, except on a few occasions where the coarser numbers had to be used.

Foreign manufacturers, being in-



Showing construction details of wood frames for stencil screens. The construction depends more or less upon the permanency desired, using straight-grained smoothly-planed lumber.

E—This type is probably the quickest to make, as the joint is mitered and corrugated fasteners are used for jointing the pieces together. In addition to corrugation fasteners, corner-irons may be used on the top side of large frames.

F—This is the straight-cut joint, assembled so as to give extreme rigidity. It may be put together with corrugated fasteners, nails or screws.

G—The halved joint makes a substantial frame and joined with nails or screws.

H—The laminated frame is made to give maximum rigidity and prevent warping.

I—The beveled frame, used by some processors in conjunction with transfer photographic stencil screens. The silk is applied to the bevel with tacks.

J—This is the production-type frame. The frame lumber is milled with a small square groove. In applying the mesh material, it is temporarily stretched to the outer edges of the frame and held with brads. The square cleat, or dowel stick which is a trifle smaller than the groove, is forced down into groove over the cloth and held in place with small brads driven in about 8-in. apart. The cloth is trimmed up to the outer edge of the cleat or groove.

K—This is a grooved frame also, but instead of a cleat or dowel stick, waxed rope is inserted into the groove over the cloth, with a special tool devised for this purpose. With either the J or K types, the used silk can be removed by lifting the cleats or pulling out the rope, leaving the frames always in good shape, free from tacks or tack holes.

L—Here is the floating-bar type of frame. While the illustration shows only one bar, two bars can be used, one at one end and the other along one side. The bars are drawn up with wing nuts to tighten the silk. These types are used only on extraordinary large printing, where it is impossible to stretch the silk taut by hand.

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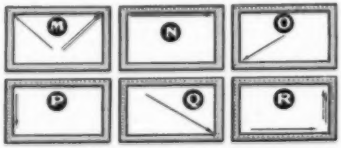
fluenced by the American importers, were prevailed upon to produce a less expensive silk especially suitable for the stencil-screen printing industry. This was finally accomplished by changing the more expensively made, full and half gauze, interlocking weave to the less expensive over-and-under taffeta weave, which is known as stencil silk. While being of a taffeta weave, stencil silk carries the same



This illustrates the proper way to stretch and tack the cloth to frame. The illustrations speak for themselves. Some processors use other methods, but this is the logical way, as the cloth can be stretched perfectly taut without waves along the sides.

uniform mesh, mash count and the same quality and weight of silk as used in the standard X grade of bolting cloth.

The numbers by which both bolting cloth and stencil silk are purchased, designate the degree of coarseness or fineness. In bolting cloth, including grit gauze, the numbers for a given grade run in 28 different mesh counts, from 4/0 (0000) which is very coarse, to number 25, which is extremely fine.

Stencil silk runs in one standard grade only, in numbers of from 6 to 18, in mesh counts of 74 to 170 per lineal inch. There is no X, XX, or XXX in taffeta weave silks, as one is sometimes lead to believe. Numbers 8, 10 and 12, in both bolting cloth and stencil silk, with a lineal mesh count of 86, 109, and 125, are the standards for all types of cut films, while numbers 14, 16, and 18, with a mesh count of 139, 157 and 170, are generally used in making hand-blocked washout and photographic stencil screens.

Merits of Wire Cloth

The only other mesh material, besides bolting cloth and stencil silk, that can be used successfully for photographic stencil screens is wire cloth — the more expensive phosphor bronze and stainless steel wire mesh in their respective numbers of 150, 200 and 300. Number 150 is equivalent to a number 25 silk, while Nos. 200 and 300 are even finer than any silk used for stenciling purposes. Wire cloth has a definite place in stencil-screen printing and is used quite extensively in long-run printing of ceramic colors to glassware.

Today and since 1938, both stencil silk and bolting cloths are being produced in this country by one lone organization and, while the price is about the same as the imported silks with their added duty, there is some material difference in the quality, although it is not objectionable. Also, in the past 10 to 12 years, we have been receiving a very good grade of both stenciling silk and bolting cloth from Japan. The price, including the same duty, is less than that of the European grades. Recently shipments have been unreliable, although we are still receiving some of the Swiss makes.

So, in the face of foreign complications in both directions, it might be well for us to accustom ourselves to the use of American produced silk, regardless of its price or quality. Several American manufacturers are producing wire cloth, including the grades mentioned.

Silk Organdy

Disregarding wire cloth entirely, the next best mesh material is silk

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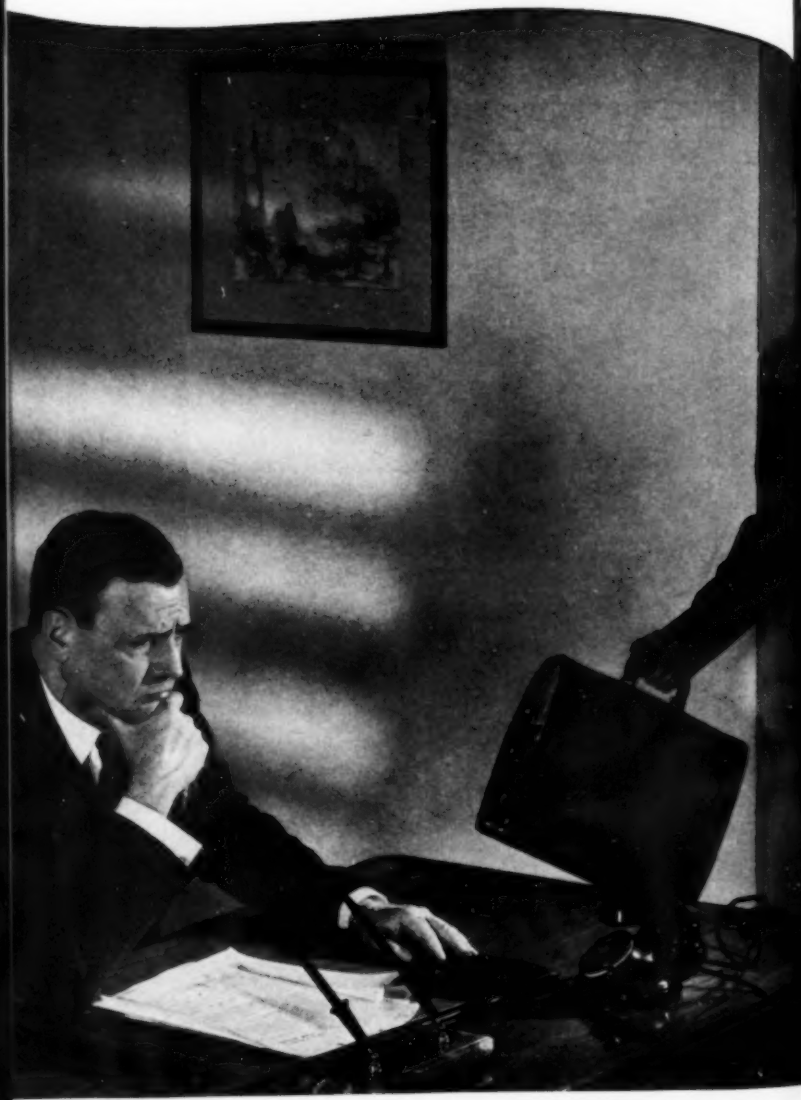

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POOR MR. MURRAY. Right now his head hangs heavy with finishing problems. But—thanks to our staff of worry-specialists—he's soon going to be much happier indeed.

The Du Pont worry-specialists, you see, *like* to worry about finishes. They're a group of research chemists, laboratory technicians, production men, service engineers and field representatives who *thrive* on solving finishing problems.

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Egyptian Lacquers and Egyptian Industrial Finishes are literally "films" of outstanding Beauty and durable Protection. They have proved their superiority on thousands of manufactured items during the past half century. So why experiment?

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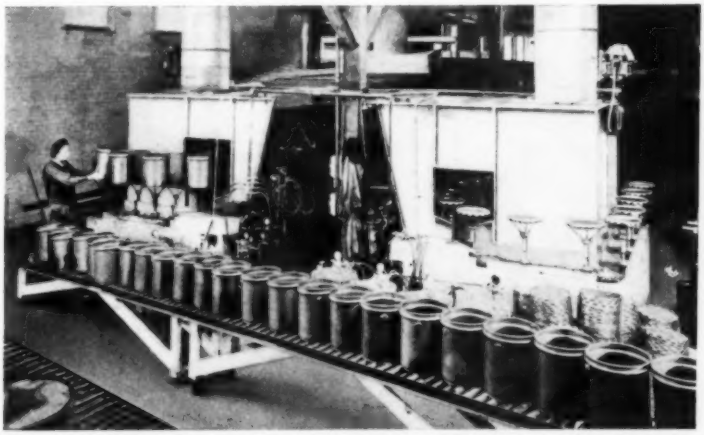
organdy, so named by the importers to avoid conflict with the higher priced stencil silks. This material in reality is a cheaper-woven light-weight pure-silk-strand taffeta-weave silk. Its tensile strength is about four times that of organdy voile and six times that of regular first quality organdy. Both the foreign and domestic grades are of one standard width of 48-in. and, like the other silk meshes, they come in 30-yard bolts. The mesh count varies, but it is approximately that of No. 6 stencil silk, and it costs about one-third of No. 6 silk.

Organdy Voile; Regular Organdy

Next in line is organdy voile, sometimes referred to as "Orvon" cloth and Ovo-cloth. This is a cotton material, the best grades of which are imported from Switzerland. It comes in 45-inch widths, in 30-yard bolts, and retails for about the same as silk organdy. Being of a heavier thread, it leaves a heavier deposit of color to a surface than does either silk organdy or regular organdy. It is occasionally used for surface coating, and for cloth, metal and wooden signs; and for discharge color printing of billiard cloth games of chance.

Last but not least is regular organdy. This also comes in approximately 30-yard bolts, and in various widths up to 60-in. The best grades are still being imported from Switzerland. It is used generally in the sign shop for short-run printing on competitive items.

From a most practical point of view, and to those who desire personal satisfaction and take professional pride in their finished product, with a minimum of interference, waste or lost motion, it is suggested that the higher priced superior mesh materials be employed.



Here is an overall view of a complete automatic installation for coating the insides and outsides of 5-gallon pails; also a companion machine for painting the top sides and under sides of the covers for these pails. This machine enables the manufacturer to get his pails painted inside and outside with two different kinds of material at the rate of 800 to 1000 pails per hour. Photograph, courtesy of Binks Mfg. Company.

For Abrasion Testing of Coatings

An efficient and accurate testing machine for evaluating resistance of surface finishes to rubbing abrasion, such as paints, lacquers and plastic surfaces and textile fabrics ranging from sheer fabrics to upholstery has been developed and is being offered by the Taber Instrument Co., North Tonawanda, N. Y. The primary elements of the abraser are the motor-driven turntable on which the specimen is mounted, a counter to indicate the number of abrasion cycles, and two abrading wheels that alternately rub back and forth, and at the same time, criss-cross in their rolling path. These wheels are made in five types of closely controlled resilient material charged with special grades of fine abrasive grain.

The "Research Model" is provided with standardized load adjustment for varying the pressure of the wheels against the specimen to suit the type of material being tested. For instance, the pivoted arms without auxiliary weights apply a pressure against the specimen of 500-grams per wheel, which is recommended for general use on textile fabrics. The addition of the auxiliary weights increases the pressures to 1000-grams, which is the standard for longer wearing materials and finishes generally classified as paint, lacquer, plastics, and metallic plating.

Research model of Taber abraser.

In general, the wheel pressure selected should accelerate the test to the point where the duration of the result ranges from 500 to 5000 abrasion cycles. Thin sensitive coatings and delicate fabrics require the use of the counterweight with which a pressure of 125-grams per wheel is obtained (arms less auxiliary weights). The lighter pressure increases the duration of the test permitting a better comparison than would otherwise be possible.

Supplementing the wear resistance test is the "shear-hardness" test performed by attachment E-3720, which measures the toughness quality of a plastic surface or its ability to resist digs, scrapes, and similar physical damage not classed as normal wear.

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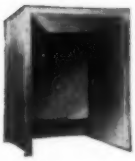

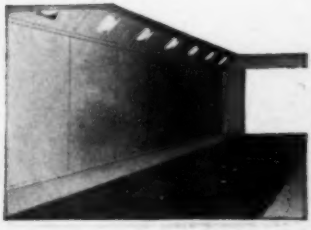

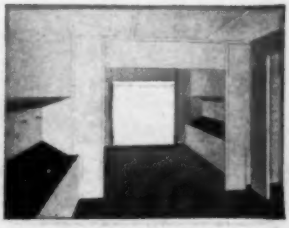

operates with so much power economy—saves so much floor space—can be installed at such a reasonable cost.

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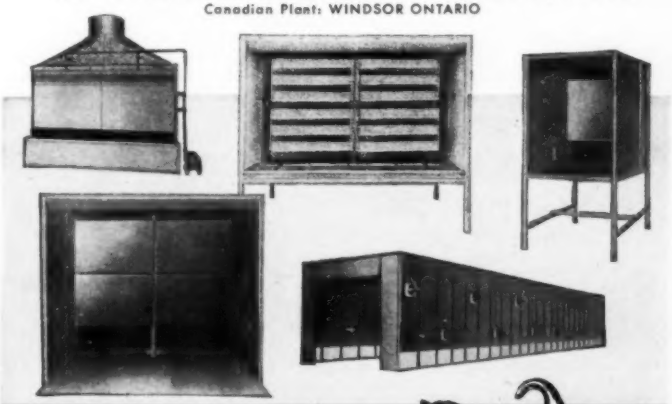

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information or diagnosis, we can proceed to manufacture a bleach developed for that one manufacturer's use, and intended to fulfill his own requirements. To obtain this information we have a questionnaire which will be sent to any finishing foreman who requests our service.

"In effect, the finisher turns over to us his wood-bleaching problem and the details which affect that problem, so that we can intelligently offer him the correct material, which has been made for his use. There is no charge for this service, and the custom-made wood bleaches are offered in the present price range of ordinary wood bleaches.

"It is extremely feasable for manufacturers interested in quantity production of furniture to use a force-drying system of wood bleaching calculated to effect a large saving in time of drying and bleaching. To such quantity users of wood bleach we can offer the same custom service and materials . . . In all cases, it will be found that using these new bleaches will create a saving in time and labor and eliminate doubtful results.

"Due to the variety of types which it is possible to create, we have named the new bleaches 'Custom Bleach' and assign to them a number or symbol which will distinguish them to the user."

Weather-Proof Silk-Screen Enamel

Weather-proof silk-screen enamel dries hard and flexible with a high gloss finish. The colors are permanent and will withstand exposure to the elements for an indefinite period. Complete drying occurs in about 12 hours. When dry, this weather-proof enamel presents a hard glossy durable surface. It does not require a finishing coat of clear varnish for outside exposure, although this is desirable for maximum permanency.

The material comes in paste form and may be thinned for most purposes. The manufacturer, Naz-Dar Co., 4014 N. Rockwell St., Chicago, Ill., recommends its No. 800 Reducer for thinning, with a small amount of mineral spirits added if desired. This material is claimed to be an exceptionally high-grade product for printing signs, decalcomanias, posters, toys, book covers, wagons or any surface or display that must withstand outside exposure for long periods.

Industrial "Floodlite"

The new Birdseye Floodlite, designed for general lighting purposes, delivers a concentrated flood of light in a medium beam that is especially effective in applications requiring intense illumination for exacting work. The Floodlite is essentially an incandescent filament bulb with a lining of pure silver sealed inside to form a reflecting surface that cannot be dulled or tarnished by dust or fumes. For localized lighting to supplement general illumination, a detachable swivel socket focuses the light exactly where needed. The Floodlite is made in the "RE" short bulb, in four sizes and four separate voltages, from 100 to 300 watts, and 110 to 125 volts. Made by Birdseye Lamp Sales Division, Wabash Appliance Corp., 335 Carroll St., Brooklyn, N. Y.

Safe Finish Remover

The industrial Chemical Development Corp., 331 Madison Ave., New York., N. Y., announces "I. C. D. Formula No. 9", the non-inflammable remover for removing coats of finish without injury to the surfaces treated —either wood, metal, fabric or leather. According to directions, the material is spread on with a brush, allowed to remain 5 to 15 minutes and then rubbed off with a rag, steelwool, wire brush or scraper. There is no need to wash the surface with any solvents

IT'S OUR AD...but YOU will get the POINT!

Improve your profit score with a few points from Stanley . . . by finishing your product with the coating *best suited* to your particular needs. Stanley chemists have helped manufacturers everywhere to cut finishing time and costs, to improve the appearance and salability of their products. Our files contain countless formulae for practically every type of application. We may have . . waiting . . the *very finish you need!* Your inquiry incurs no obligation. Address Department "C".

THE STANLEY CHEMICAL CO.

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Lacquers · Enamels · Synthetics · Japans

A SUBSIDIARY OF THE STANLEY WORKS NEW BRITAIN CONN.

after paint is removed. Paint, lacquer, enamel or shellac can be applied immediately after removal of old coatings.

From a booklet of facts about the remover we learn that this "I. C. D. Formula No. 9" leaves no wax deposit, doesn't raise the grain of the wood and doesn't injure the bleached wood in fine furniture or woodwork.

New Water Filter

Many engineers will be interested to learn that the well-known "Radial Fin Construction", successfully used by Staynew Filter Corp., Rochester, N. Y., in more than 500,000 filters for air transmission lines and internal combustion engines, has now been adapted

The radial-fin insert.

in a new model to the filtration of water. The new filter, known as the Model CPHLS for water filtration, has already proved its value, under actual working conditions, to users of hydraulic systems and humidifying apparatus, chemical plants, and to many other less well classified users.

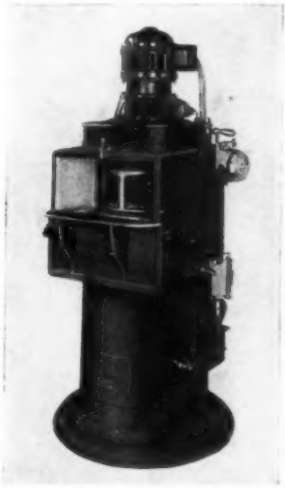
Construction is simple and filtering action positive. All water passes through special fabric filter mediums possessing the advantages of high efficiency plus minimum restriction to water flow—advantages which are increased by the radial-fin construction. This construction permits a large area of filtering medium to occupy a relatively small space. For example, a radial-fin construction insert only 11-in. high by 8¼-in. in diameter possesses an active filtering area of 1325-sq. in.

There are no moving parts in the new filter, and the large filtering area permits long periods of operation without any attention whatever. When necessary, the entire insert can be easily removed by merely unbolting the head and removing one wing nut. The units can be arranged so that cleaning is effected by backwashing with clean water.

Lightness and compactness are also important advantages of the new filter when space is limited, or overhead locations are required.

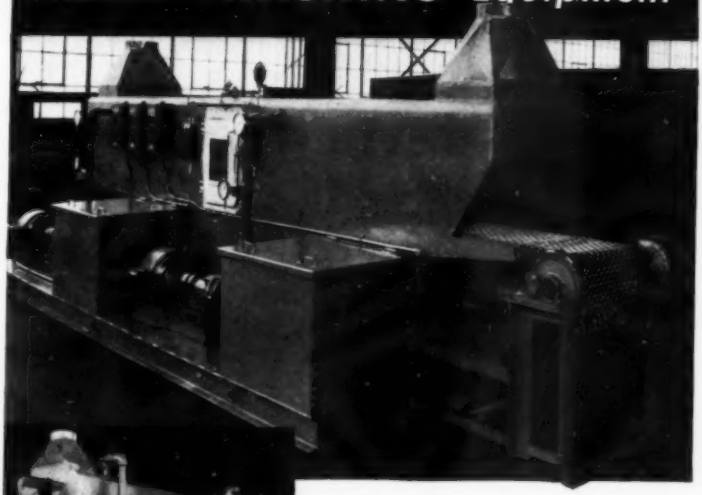
Improved Speedip Whirl Enameler

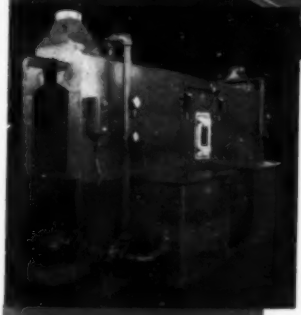
The Ronci Machine Co., Providence, R. I., announces an improved combination dipping-whirling machine for completely coating large quantities of



This machine automatically enamels small articles quickly, safely, economically.

Mahon FINISHING Equipment





METAL CLEANING MACHINES

are an important part of almost every Finishing System. Large view shows the Mahon Apron Type and, directly above, the Monorail Type, two methods used for conveying parts through the washing compartment.

. . . puts

FINISHING on a PAYING BASIS

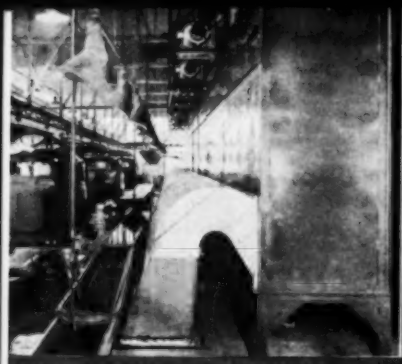
The operating efficiency of any Finishing Equipment depends largely upon the practical experience and the knowledge of modern production methods of the organization that makes it. Weigh this factor carefully when considering the purchase of such equipment—which so directly affects profitable production in your plant. It is the reason why more and more manufacturers are turning to Mahon for properly engineered, thoroughly coordinated, dependable Complete Finishing Systems—or any single Finishing unit. Your inquiries will have our most careful attention.

THE R. C. MAHON COMPANY

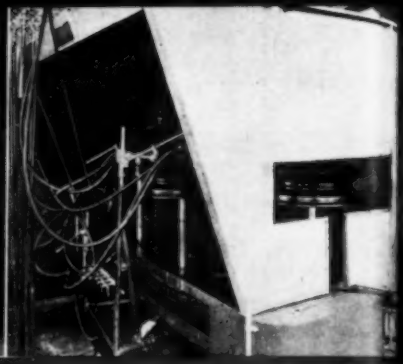
DETROIT — — CHICAGO

Designers and Manufacturers of Complete Finishing Systems, Metal Cleaning Machines, Rust-Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors and Many Other Units of Special Production Equipment.

MAHON



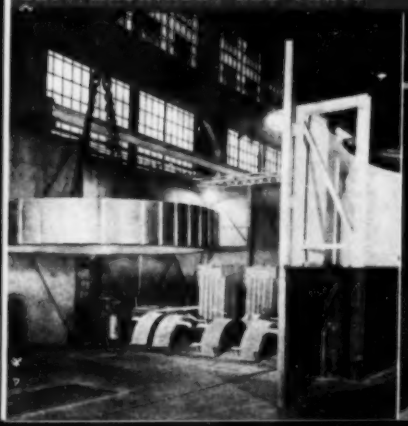
AUTOMOTIVE REFINISHING



WHEELS AND ROUND OBJECTS

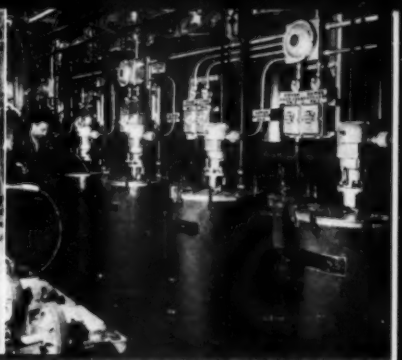
What Is Your Finishing Problem?

HEAVY MACHINERY AND PARTS



BODIES OR LARGE PARTS

BETTER SPRAY BOOTHS



PAINT CIRCULATING SYSTEMS

These photos illustrate a few of the thousands of finishing problems that have been licked by BINKS Engineers. No matter how big or small YOUR finishing problem is, you will find BINKS Engineers glad to help you. Spray guns, Dynaprecipator booths, automatic finishing machines, paint circulating systems, and other finishing equipment made by BINKS are saving time and money for internationally known manufacturers the world over. They can save for you, too.

TELL US about your finishing problems. Without obligation a BINKS Engineer will make a careful survey of your plant and submit plans and costs for better and faster finishing.

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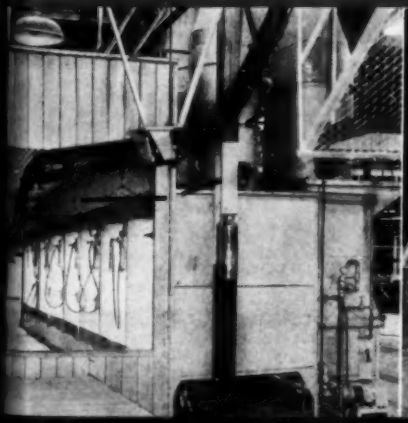
PRODUCTION LINE FINISHING



FLATWARE OF ALL KINDS

small parts with lacquer, enamel, paint or any other liquid finishing material.

"By the material being enclosed in the machine, there is very little evaporation—and too, there is always a solvent atmosphere which is necessary in order to get the proper leveling on the parts being coated.

Parts to be coated are placed in a wire mesh basket. The loaded basket is placed within the machine, a door automatically closes, the basket is lowered into a tank of coating material and then raised and rotated rapidly to throw off excess paint or whatever kind of coating is being used. Contents of the basket are emptied onto trays and allowed to air dry, or they may be placed in an oven for the coating to be baked.

Machines are available in different sizes and capacities. Each one is equipped with an in-built explosion proof motor for furnishing power. Allowing time for loading and unloading, 20 to 25 complete operations per hour are the usual average, according to the manufacturer.

Decorative Finishes

V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago, Ill., announces three new decorative finishes as follows:

"Dolcoloid", an improved hammered-effect which does not dull or tarnish.

"Silver Spray Finish", the new "sparkler" of exceptional brilliance. New colors in wide ranges include Sun Tan, Sand Tone, Harvest, Quartz, Champagne, Perfect Walnut, etc.

"Fabric Finish", for wood or metal. Something different in texture. Complete finish requires only single application on metal and two coats on wood. No baking; quick drying and exceptionally durable.

Referring to still another of the company's products — "Tops" is a quick-drying combination of synthetic varnish and nitrocellulose lacquer, perfectly blended to produce a finish of unusual depth and toughness.

New Solvents Recovery Plant Opened at Linden, N. J.

The Solvents Recovery Service, Inc., with general offices and main plant at Newark, N. J., announces that their new plant at Linden, N. J., began operations February 24.

This company is engaged exclusively in the business of recovering solvents from dirty wash and lacquer thinners. It uses the Lofgren Process in recovering the solvents. This method has proved so satisfactory that every year more and more manufacturers, who use lacquer thinners for washing, stripping, degreasing, and general cleaning, are taking advantage of the large savings made possible by having their dirty thinners cleaned.

The new plant at Linden has been equipped with the latest type of recovery apparatus and provides the Solvents Recovery Service with much needed facilities for handling the steadily increasing demand for this form of service.

Coatings for Steel Containers

A new brochure, "The Facts About Protective Drum Linings for Steel Containers," is of interest to the soap, food products, beverage, petroleum and other industries where products are packed in steel drums or kits. Published by Ault & Wiborg Corp., the book contains a comprehensive study of the various types of lacquer linings used to protect packaged materials from contamination or deterioration through contact with the steel containers in which they are shipped.

The brochure points out that care must be exercised in selecting a protective lining for a specific application, since the resistance characteristics required will vary considerably with different products. Tables are included which show which linings should be used for various types of materials and how many coats are necessary. Descriptions of the specific linings are also contained in the book, with laboratory data and recommendations for application.

A copy of "The Facts on Protective Drum Linings" is available to manufacturers who write to Ault & Wiborg Corp., 75 Varick Street, New York.

One Lacquer FOR MANY METALS

OLD TYPE

NO LONGER do you need a variety of special lacquers to finish several metals. M&W Universal Lacquer simplifies your production. This new, high-grade, clear M&W lacquer can be applied with excellent results on *all* commonly used metals and alloys.

It's the ideal lacquer for name plate manufacturers and others making products out of several kinds of metals.

Universal Lacquer is very light in color ... adheres well ... is flexible ... withstands stamping and forming ... resists outdoor weather; also sulphur ... good color retention ... air dries quickly.

Full information on request

Maas and Waldstein Co. Newark, N. J.

Branch Offices and Warehouses . . . 1658 Carroll Ave., Chicago . . . 1238 W. Pico Blvd., Los Angeles

LACQUERS PIONEERS IN PROTECTION ENAMELS

Metal Cleaning Problem

Please advise where we can obtain a metal cleaner that will degrease and clean metal by spraying only. If necessary, we can heat the liquid. Also, it must have the property of drying itself in normal atmosphere or in a low-temperature oven. This material is to be used on cabinets that have been assembled by spotwelding. — J. Metal Products.

The material and method to be used will depend upon several factors not mentioned in your inquiry. Among these factors are: 1) size, gauge and shape of work; 2) kind of contamination and degree of cleanliness required; 3) size of loads and amount of production, and 4) handling method preferred.

Degreasing is the most rapid and efficient cleaning method where the material to be removed is oil, grease, and kindred contamination. This process employs heated solvent which cleans in both the liquid and vapor phases. The vapor phase is sufficient for some heavy-gauge work with relatively light contamination.

Spraying the solvent in specially designed degreasing machines is most effective in the removal of loose insoluble soil, provided that the shape of the work is such that sprays can be made to effectively hit the surfaces to be cleaned, and that the work can be hung in a position to drain. The vapor-spray-vapor cleaning method is used on large work and work of light-gauge where the production volume is sufficient to make this process economical.

The work comes from a degreasing machine clean, warm, and dry. It is ready for immediate painting without any cooling if the paint is such that it can be applied to a warm surface. In many cases, in addition to speeding up production, it is distinctly advantageous to the coating if the paint be applied to a warm metal surface.

The chlorinated-hydrocarbon solvents used in degreasing are non-inflammable and have a powerful, rapid, solvent-action for organic materials such as fats, waxes, and animal, vegetable and mineral oils. Trichlorethylene, which is stabilized against break-down due to heat, moisture and combinations of metals, is the preferred industrial degreasing solvent.

For highest efficiency, most metal-cleaning applications require detailed data which is generally obtained by an engineer's survey.— DETROIT REX PRODUCTS CO.

There are a number of ways in which this work can be handled. Probably your best course is to call in the representative of a reputable concern that specializes in furnishing materials or equipment or both for cleaning metal products on an economical production basis. Let him make a survey of the work to be done and the facilities for handling it. In this way the proper

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

WHAT EVERY SMART WOMAN KNOWS...

★ Without the benefit of finish, many a woman blessed with natural beauty would look quite ordinary.

Rouge, powder, lipstick and nail polish are the finishing materials that enhance natural beauty... materials that are on the "must" list of every smart woman because she knows their value. . . . Finishing materials and the manner in which they are selected and applied are just as vital to the beauty appeal of commercial products. If you are interested in giving your product a more attention compelling finish, write us about our Creative Studio Service... a service rendered to reputable firms without cost or obligation.

ROCKFORD VARNISH COMPANY

Manufacturers of Finishing Materials

ROCKFORD • ILLINOIS

recommendations can be made, based on his company's many years of experience in handling all types of metal-cleaning problems.

It may be that a tank of cleaning solution into which the parts may be dipped will be most satisfactory, while on the other hand the use of mechanical washing machines may enable you to turn out more production at lower per unit cleaning cost. This and other factors necessarily must be taken into consideration in making an intelligent recommendation.—OAKITE PRODUCTS CO.

Paint That Changes Color by Heat

Referring to the inquiry and answers about the above named subject, as published in February issue of INDUSTRIAL FINISHING (pages 93, 94 and 95) we are pleased to include the following information:

"From the information we have available, several concerns have inquired about this product for use in a paint that changes color when heat is applied, but we are not familiar with any concern actively engaged in manufacturing a paint of this type. Mercuric Cuprous Iodide has the property of changing color when heat is applied. Its original color is red and it becomes black on heating, returning to red when cooled." — MALLINCKRODT CHEMICAL WORKS.

Quoting from literature supplied by Rogear Co. (Products for Problems) New York City:

"Efkalin Emergency color-changing paints and inks have the property of changing color, when exposed to heat. The application of Efkalin Emergency is profitable as a timely warning on all visible parts of many types of apparatus and equipment against overheating ... Only small areas need be covered, to be effective. The following types are available."

Number	Temp.	Color
1:P-R	185° F.,	Red to Brownish Black
2:P-R	104° F.,	Yellow to Orange
3:P-R	122° F.,	Green to Brown
4:P-R	239° F.,	Yellow to Red
5:P-R	158° F.,	Rose to Bluish Grey
6:P-R	365° F.,	Red to Brownish Black
7:P-R	464° F.,	Red to Brownish Black
B:P-P	284° F.,	Red to Yellow
C:P-P	338° F.,	Red to Grey
D:P-P	536° F.,	Red to Brownish Black
E:P-P	590° F.,	Red to Brownish Black
F:P-P	734° F.,	Red to Brownish Black
K:I-R	185° F.,	Red to Brownish Black
L:I-P	284° F.,	Red to Yellow

Note: The initials P-R indicate "Paint, Retroactive"; P-P, "Paint Permanent"; I-R, "Ink Retroactive"; I-P, "Ink Permanent".

Incidentally, these paints and inks are high priced—more per ounce than you pay per gallon for high-grade lacquer.—EDITOR.

Special Coatings Wanted

Some years ago we saw a liquid material which, when applied to flats and rounds, produced an appearance and "feel" as though those surfaces were covered by hard rubber.

We also understand that there is another substance now on the market that can be spread on and gives the appearance of a fabric coating.

Can you give me any information regarding these—R. D. Co. (Fine Store Equipment).

I am unable to recommend anything for the first case, but in the second case I am wondering if you might be referring to the type of

...from sardine can coatings to golf club lacquers

MANY years of practical experience in many industries . . . on many products . . . qualify us to help you with your finishing problems. From Berry Brothers laboratories have come many outstanding finishing developments, including:

LIONOIL, first organic rust preventive.

ZINC CHROMATE PRIMER, pioneered.

MULTIFORM, first production line application.

SHELLAC AND LACQUER SEALER, pioneered ready-mixed types.

INFRABAKE FINISHES, one of first in field.

BOXX PRIMER SURFACERS, dry on oiled surfaces.

Finishes for many products from tacks to locomotives, rust inhibiting primers, wire enamels, tack rag varnishes, wrinkle finishes, wood handle finishes, steel sash primers, tile setting compounds, Raven Line blacks, paper coatings, glass sealers, pottery size and battery finishes . . . Berry Brothers make them all!

Take advantage of our 83 years of practical experience. Tell us what your finishing problem is and we'll tell you what to do with it.

BERRY BROTHERS

Industrial Varnishes • Enamels • Lacquers

DETROIT, MICHIGAN • WALKERVILLE, ONTARIO

JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

finish known as "flock" finishing. In this process a lightly pigmented enamel is sprayed upon the object to be finished, and a fine cotton flock is then blown by a special spray apparatus over the surface. After the paint film dries and the excess flock is brushed off, you have a finish that resembles suede. A wide variety of colored flocks is available, as well as flocks of different fibers, such as cotton and rayon. It is usually well to use, as an adhesive, an enamel which has a color fairly close to that of the flock being used.

I have just learned that our Cleveland laboratory has produced a finish that is about like suede, which closely resembles genuine leather, I am obtaining information in regard to this finish, and just as soon as it is available, I will transmit it to you.—H. DANIELS.

A "Piano Finish" for Caskets

We would like to develop on the finish of some of our mahogany, walnut and other woods, a finish that some of our customers refer to as a "piano finish". We have been advised that you could give us this information or could tell us where such information could be had. If you can tell us the procedure to go through to get a highly polished "piano finish" on wooden caskets, we will appreciate this service.—W. Casket Co.

The term "piano finish" is a broad one and one which varies somewhat with individual conceptions. The common conception, and the one in which I believe you are interested, is that of a very well filled, well rubbed, highly polished finish with a great deal of depth and brilliance. Oddly enough, pianos are not finished that way now, although many radio cabinets and occasional and novelty pieces of furniture are. *Pianos and very expensive furniture are finished close to the wood and rubbed very dull to a satin luster.* We may assume, however, that your interest lies in a brilliant, polished, rich-looking finish.

Fundamentally, there is one word that sums up 90% of the difference between a finish of "piano grade" and any other clear wood finish—*workmanship.* One of the finest finished pieces on the market today is the cabinet of a low-priced radio. The same type of lacquer and essentially the same operations are used. Concentration on quality work accounts for its outstanding appearance.

In brief, a piano finish includes a permanent fade-resistant stain, such as a water stain or non-grain-raising stain, a thorough filling, usually a refilling, and at least four coats of clear lacquer rubbed down to a perfectly smooth surface.

A practical piano type finish for your purpose might be applied as follows, adapting the process to modern production and cost requirements:

Finish-sand the work with an abrasive paper no coarser than No. 7/0, preferably after a sponging or a thin glue sizing. Blow out the sanding dust thoroughly. Spray a wet coat of a non-grain-raising stain of the desired color—walnut, mahogany, etc.—and allow this to dry for one hour. Spray a thin wash coat of white shellac or a very thin coat of lacquer to hold down the fibers. Scuff it off lightly with fine sandpaper after one hour's drying time.

Neither STERILIZATION nor DEEP DRAWING can DULL or DAMAGE this BRILLIANT BLACK FINISH

Jet-cote

FOR SPRAY, DIP OR ROLLER APPLICATION TO METAL

Jet-Cote is a bright black metal coating that stays black and brilliant through all the abusive processes of fabrication . . . including deep drawing and sterilization. It can be used directly on metal without sizing. Ask for details.

. THE WATSON-STANDARD CO.
Manufacturers of
PAINTS . . . VARNISHES . . . INDUSTRIAL FINISHES AND LITHOGRAPH COATINGS

TOUGH JOB HEADQUARTERS
℞ Prescription Finishes
Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

FACTORY AND GENERAL OFFICES: PITTSBURGH, PA.
IN CANADA: THORPE-HAMBROCK CO., LTD., MONTREAL
WAREHOUSES: BOSTON : BUFFALO : DETROIT : NEW YORK

Use a fast-drying filler, cut in the proportion of 10-lbs. of paste to a gallon of mineral spirits. Brush it on, allowing it to set to a dull flat appearance before padding thoroughly in a figure-8 motion across the grain to fill the pores level full. Wipe clean but wipe it lightly with the grain. Do not try to force heavy filler into the pores; have it thin enough to run in.

In the drying of this filler, you may "get away with" as little as two to four hours of drying, but overnight drying is much better. Drying time cannot be compromised; the best rule is to give each application of material a little more rather than a little less drying time. If it is possible to force dry the work, then a drying time of two hours at 110° to 120° F. is practically as good as an overnight dry.

Spray three coats of high-bodied clear lacquer over the dry filler. One coat a day is ideal; two coats a day is enough, but you may be able to get away with all of these operations in one day, so the procedure will be determined by your space and your production requirements. Give the lacquer all the drying time you can before rubbing. Overnight is the minimum. If you rub in less than 36 to 72 hours, you may expect some shrinkage. In other words, after a day or two following rubbing, the pores will all be open again and the work will look only half rubbed due to shrinkage of the film from the emergence of the last "tail" of the lacquer solvent.

Steinway pianos stand from one to four months after lacquering before rubbing, just to avoid any semblance of this condition. Contrarily, fine furniture seldom gets more than an overnight dry before rubbing. There is a little trick used by many furniture people which possibly may be available to you. They store their goods in the gloss after lacquering. Then, when it is ordered out of stock, the pieces are rubbed just before packing. If they stand for a week or more, you need have no fear of shrinkage.

For rubbing, use a No. 8/0 aluminous oxide abrasive paper with a dry back (you don't need a waterproof abrasive paper unless you use water when sanding) and keep the work wet with mineral spirits. If you wish a high polish, get the smooth level surface first with this fine abrasive paper; then finish with a compound of the type used in automotive work. Use the compound sparingly. Rub until the surface is quite dry and until all scratches are gone. Remove the final compound haze with a polish, such as Dupont No. 7. Don't use an oil polish of any kind, as it will "sweat back" and haze the highly polished surface. If you wish the characteristic piano dull luster, finish off the sanding operation with No. 4/0 steelwool, used dry, and omit the compound and polish.

What I have just described is, I believe, the fastest system by which you can apply such a finish. It has been boiled down to the essentials. As indicated, this finish may be applied in about 24-hours with fairly good results. You have merely to stretch out your drying times to have a system comparable to the finest finishes applied on any wood product. These are the necessary operations — although you might add a wash coat between the stain and filler. The excellent appearance of the finish you wish to produce will depend on the time and workmanship you are able to expend on your hardwood caskets.— W. T. SMITH.

SPEEDROY

A New Fast-Drying Royalty Flexible Lacquer Conforming to the Rudd High Standard of

- UNIFORMITY
- QUALITY AND
- PERFORMANCE

• GLOSS—RUBBING—NON-RUBBING

• FLAT—SATIN—DEAD FLAT **• SEALERS**

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NOROY (non-royalty) cold check resistant lacquers deliver 21 to 37% solids at the gun sprayed cold. One coat produces a beautiful alcohol proof finish that shows no breakdown after fifteen cycles of cold check testing at +105° to —5°.

For Complete Information—Write to

RUDLACO

RUDD LACQUER CORPORATION
127 MAIDEN LANE, NEW YORK
Factory—Rahway, N. J.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Fumed Oak Finish on Furniture

We have a rather large order for wood library furniture. Specifications for the finish, as furnished by the architect, require the furniture to be finished in fumed oak. We are wondering if you can give us any detailed information on how this process of finishing is carried out?

We inquired from the architect just what his idea was about the fumed oak finish, and he said that the furniture must be placed in an air-tight enclosure in which ammonia gas is used to fill the room. He then stated that the furniture is to be filled and waxed.—I. G. Co.

Fumed oak is one of the old standbys of which little has been seen for many years. Originally—and I mean 25 years or more ago—the method of producing this characteristically rich golden colored finish was as follows:

The rawwood was treated, by dip or brush, with a solution of ½-oz. of pyrogallic acid to a gallon of water. Following this, the piece was placed in a fume box—a practically air-tight enclosure which was filled with ammonia gas by the expedient of placing shallow pans in the bottom and filling same with industrial liquid ammonia. When the wood had reached the depth of shade desired, it was removed, dried and given two coats of thin white shellac, and varnished. *Fumed oak was not filled.*

This, I say, *was the method employed*—which is given here to defend your architect in his suggestion of a fume box. However, all of this has been relegated to the limbo of obsolescence. Fume boxes have not been used for many years. They date back with such items as potassium bichromate, logwood extract, vinegar and sour beer as finishing adjuncts.

The modern method may be typified by the recommendation of an advertiser in this magazine—a concern that manufactures a *fumed oak acid stain*. This stain is brushed on the wood and allowed to dry overnight. The surface is then sanded and given two coats of thin white shellac; sanded lightly and waxed. In the event that the wood contains much sap, the use of a "fumed oak toner" is recommended. This is brushed over the wood first, allowed to dry and then followed with the stain, as described above.

The writer is purely disinterested, having no connection with any stain manufacturer, but is glad to recommend the company (name on request) as well qualified to help you with this finish.

In the event that your customer insists on a filled job—and I hope he doesn't, since it does not belong in fumed oak—a neutral brown filler might be applied over the first coat of white shellac, after the stain, and followed by two more coats.

May I venture this suggestion? Make up a sample, as just described (with a stain and two coats of shellac and waxed) and find out if it is acceptable.—W. T. SMITH.

Cleaning Sheep's-wool Buffing Discs

Have you any suggestions as to a satisfactory method of cleaning sheep's-wool discs? The foreman of our finishing room has tried cleaning fluid and, not having much success with that, he tried water and soap, but still no luck.

We use these discs on a machine, rubbing or buffing a case after

WITH P&S HOT SPRAY LACQUER

The reason is simple: P&S Hot-Spray Lacquer permits the use of *heat* rather than lacquer thinner to obtain spraying consistency. Thus considerably more actual solids are deposited with each application. This increased solid content produces with 2 coats a finish equal in quality and appearance to 3 coats of cold sprayed lacquer . . Major economies are at once apparent — lower material costs less application time—less orange peel to rub out—lowered labor and handling costs. Let us send full details of this time-proven method for reducing woodfinishing costs. Your inquiry will receive prompt attention.

PIERCE & STEVENS • INC.

716 Ohio Street • Buffalo, New York

the lacquer has been applied. After using the discs for a while the sheep's-wool gets hard and rough. —E. K. Co. (Caskets).

In regard to cleaning sheep's-wool discs, I can see no reason why they should ever be cleaned. If the right kind of compound is used the disc will clean itself by centrifugal action. There is the possibility that your man is trying to use hand-rubbing compound, which will quickly gum up the wool on a sheepskin bonnet.

We use a mixture made by Minnesota Mining & Mfg. Co. (No. PL-45) which is for machine buffing only. Newco No. 1, made by H. & N. Co., is also good.

Our bonnets are used over a period of two to three weeks without getting dirty. At the end of this time the wool is worn so short that they are unfit for further use. Each morning, before using the buffer, the operator starts up the machine and holds the edge of a wooden stick against the wool for a few seconds. This causes all of the dried compound to be thrown out. Aside from this, the buffs are given no futher attention until worn out.

Once we tried to use up some old-hand-rubbing compound with the buffing machine, but owing to the presence of so much wax in the compound, the wool on the disc soon gummed up. We did not try it again.—AL MATLOCK.

We do not use sheep's-wool buffs now, but have used them and we experienced the most difficulty with cleaning them when we used "water compound." We now use 12-in. Canton flannel buffs, four sections on a flexible shaft, at 1250-r.p.m. We use a brush with steel bristles for keeping them clean. They do nearly as good as sheep's-wool buffing discs and are a lot faster.

We now use McAleers No. 1 polishing compound, cut with naphtha to a "thin solution". This is applied to the rubbed lacquer surface and then buffed to high gloss. This buffing causes the wheel to become somewhat dirty, so we clean it with the steel bristle brush, and go over the work again with the clean wheel, after which we wipe the buffed surface clean.

The same procedure can be employed when using sheep's-wool discs, except the cleaning with the steel-bristle brush. The sheep's-wool discs do not become dirty nearly as quickly with a "naphtha compound" as they do when "water compounds" are used.

When we used sheep's-wool discs we kept several on hand; when one became too dirty to use we removed it from the machine, placed it in a pan of clean naphtha and let it soak out the compound while we used the others. Then we would take it out and blow it off clean and dry with compressed air. This procedure worked satisfactorily. However, with water-soluble compounds, it is pretty difficult to get the buffs clean. To my way of thinking, the naphtha-soluble compound is the best to use with any kind of rotary buffing disc. —F. HAGAN.

We use a very simple method of cleaning sheep's-wool discs and it has proved to be entirely satisfactory. Our method is this: We turn the buffing machine upside down, start the motor and use an ordinary "dusting gun", holding the nozzle of the gun close to the inverted sheep's-wool disc. We

A Winning Combination

● Natural wood beauty and outstanding characteristics of design achieve greatest attractiveness with Glidden's Stains, Fillers, Toners and Glazes. Add to these the superlative finish of Glidden's "500 Line" of Wood Lacquers and Sealer, and the result is *protected beauty*—protected against alcohol, hot water, hot dishes, abrasion, and sudden temperature changes.

That's a combination that is sure to win the preference of dealers and customers everywhere. Wise manufacturers "stand pat" on it, for they know that it guarantees maximum sales appeal.

Let a Glidden practical furniture finisher demonstrate this complete line in your own plant, under your own production conditions. He's available on request. Send for him—today.

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Branches or Factories in Principal Cities

start on the inside or center of disc and slowly move the duster gun to the outside of the disc. The speed of the rotating disc and the air pressure will clean the disc satisfactorily.

Of course, some buffing compounds, due to their formulation, muss up the sheep's-wool disc more than others. We use DuPont buffing compound, mixing it with equal parts of water. I feel sure that if you use a compound similar or like the one we use, you will find this method will solve your problem.—H. W. CHESTER.

Letters from I. F. Readers

(Continued from page 8)

"Window shades of a comparatively new material which is washable, tear-proof and sunproof, are being screen-printed in vivid tones to harmonize with practically every room setting from the play room and the nursery to the sun porch and living room."

We wonder if you know the name of the manufacturer making this product, or if you have samples of it that we might look at.

If there is some information that you can give us along this line, we shall appreciate it a great deal.—C. C. Corp.

Reply by Mr. Hiett:

I cannot, at present, give you very much information on this, although a customer did bring in a roll for which we had to devise a color that would adhere properly for stencil-screen printing. I know that the fabric contains some linen and, while I could not get much information on the product, I presume the pigment filler was incorporated with a synthetic varnish, such as clear Dulux, Karosiol, or possibly one of the plastics, such as Styron, Tenite, and the like. I will try to get some definite information on this for you—H. H. Hiett.

Insulation Coatings for Electrical Apparatus

We are required to furnish some of our apparatus coated with varnishes to protect electric coils and electrical equipment against ammonia fumes, and have been referred to you as a possible source of information. If you have any information on this subject, we shall be very glad to receive it—D. Co. (Electrical Apparatus).

Hot Lacquer

We are interested in receiving information about "Hot Lacquer." If you can forward our request to the proper sources we, will greatly appreciate your consideration.—A. Z. Co. (Wallboard).

Spray Booth Coating

We are interested in getting in touch with any manufacturer who makes material that can be either sprayed or brushed on a spraying booth. The booth is covered with this material, so that paint does not stick, making the cleaning of the booth much easier and quicker.—S. S .Inc. (Signs).

Tilting Drums

In your December, 1940 issue of INDUSTRIAL FINISHING, page 21, you have an illustration of a device for tilting and raising drums. We would appreciate your advising us where information about this may be obtained. We are referring to the one with the man in the illustration.—A. A. Co. (Furniture).

The one shown is a product of Morse Mfg. Co., Syracuse, N. Y.—ED.

Roller Coating Machine

Will you please advise us by return mail, your list of manufacturers of roller-coating machines adaptable to painting venetian blind slats, rails, and moulding?—S. M. Co.

See page 6, February issue—ED.

Could you give us any information regarding a roller-coat machine for refinishing furniture? Any information you can give us as to where we might get prices and details, will be greatly appreciated—D. R. Co. (Popular Price Store).

We know of no machine of this type that would be suitable for refinishing furniture. Power-driven roller-coating machines are used for coating flat sheet stock such as flat metal sheets, flat panels of plywood, venetian blind slats and sheets of flexible material

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Ewing Galloway, N. Y.

There can be no yielding to quality in this vital industry, for all raw material and equipment must be minutely tested to meet accurate specifications.

Paper, cloth and cellophane commercial adhesive tapes produced by the Industrial Tape Corporation have stood the test of time, of dependability and complete satisfaction for almost every electrical need.

With the urgent demand for more electrical equipment, these pressure sensitive adhesive tapes take their place as an important aid for insulating purposes, building motor coils, condensers, clock motors, radio parts, electric razor parts and for many other uses.

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Write to us concerning your special tape problem. Our laboratory will be glad to help, without obligation.

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NEW BRUNSWICK, N. J.

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Manufacturers
ARE
FLOCKING
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COTTON, WOOL & RAYON
FLOCKS

Applicable to Wood, Glass, Paper, Fabric, Metal, etc.

By decorating countless varieties of items by spray gun application, they are beautifying their products, stimulating sales and increasing profits.

WHAT ARE YOU DOING?

You'd better investigate these possibilities NOW and reap the benefit.

Write for Color Card and Samples

CLAREMONT WASTE MFG. CO.
CLAREMONT, N. H.
The country's leading makers

which may be unrolled and rolled up again after coating and drying.

Of course, there are small hand rollers for graining and striping, but not for spreading on paint, varnish or lacquer—that is not to our knowledge. The hand brush or small spray gun is generally used to apply whatever coats are used in the refinishing of furniture.—ED.

Lint-Proof Gloves

The paint room has me on the "spot." They have requisitioned lint-proof gloves and aprons. I have searched various buyer's guides and have failed to find such items listed. Any information or help you can give us, as to where these could be purchased, will be greatly appreciated.—R. Q. Co. (Aircraft Products).

Record Disc Lacquer

Can your magazine furnish us with the names of manufacturers of the special cellulose nitrate lacquer used in making recording discs (instantaneous)?—L. R. Co. (Recording Discs).

Sound Deadener

We require a finishing and sound-deadener material, for spray gun application to the interior of evaporative cooler cabinets. We are finishing the exterior with wrinkle, consequently the interior finish should withstand a trip into our oven. Please refer us to a source of supply.—M. P. Co. (Craftsmen in Metals).

Non-Skid Deck Paint

Will you please send us all available information with regard to a special paint for the decks of boats to prevent slipping?—B. L. Co. (Canada).

Who can tell us about such a material and who makes it?—ED.

Who Knows "In Wood?"

Can you refer us to a finishing material known as "In Wood"? It is used as a hardener for wood and masonite. —O. J. Co.

Never heard of this brand, and we find no trace of it in our directories. Can some reader supply information? —ED.

HERE it is!

cannot be marred or scratched

A lacquer finish that cannot be marred or scratched with the thumbnail, or other destructive agencies—a much tougher piece of goods than the ordinary lacquers. It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods... It is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended for the first coat.

Send for FREE WORKING SAMPLES

THE SCHAEFER VARNISH COMPANY, Inc.
Louisville — — Kentucky

Clear Metal Lacquers

In further reference to your editorial in the January issue, describing clear metal lacquers standing two years exterior exposure, we would be pleased if you would notify us the names of some of the manufacturers making this product at the present time.—A. M. of N. E.

Name of company supplied.—Ed.

Infra-Red Equipment

I will appreciate your sending me as complete a list as you can of the manufacturers of infra-red lamps, reflectors, and other equipment made for this purpose.—A. L.

Refer to pages 76-91 of February issue.—Ed.

Water-Emulsion Paint

We are looking for information on a water-emulsion paint that can be applied to paper or cardboard surfaces, and produce a tough, water-resistant, odorless film.—Y. D. Co.

Luminous Paints

If your paper has published articles on luminous paint, please send us: 1) the titles of the articles; 2) the year and month of publication; 3) the price for supplying these back numbers; and 4) your subscription price.—C. S.

Tear sheets of the few remaining articles published on this subject are being sent to you.—Ed.

Infra-Red Processes and Finish Materials Discussed at Meeting

The new infra-red baking process, which often permits the time required for baking enamels and other organic finishes to be reduced from hours to minutes, was discussed at a recent meeting of the Rochester Branch of the American Electroplaters Society. The guest speaker was G. Klinkenstein, Vice-President and Technical Director, Maas & Waldstein Co., Newark, N. J.

Mr. Klinkenstein pointed out that the new baking process, which consists of exposing products to be baked to the heat rays emitted by special electric lamps, came into wide use

last year but, as its limitations were not thoroughly understood, some applications proved unsatisfactory.

"Infra-red baking is best suited to the quantity production of similar products. It is not adapted for handling products that vary greatly in physical dimensions," Mr. Klinkenstein said. "Each installation should be designed for the specific work it has to do, and specially formulated enamels and other finishes should be employed."

Advantages of the process, where applicable, were outlined by Mr. Klinkenstein as follows: Reduces baking time; especially suitable for high-speed operations where products are handled by conveyors; equipment is easily installed and takes up little floor space; installation cost is low; working conditions are comfortable; and the fire and explosion hazard is very low.

DeVilbiss Co. Elects Officers

The election of two new vice presidents, along with a report to shareholders of increased sales during 1940 and a satisfactory corporate condition at the close of that year, were the items of major interest disclosed at the annual meeting of the DeVilbiss Co. held in Toledo, Ohio, February 24.

The new vice presidents are Howard P. DeVilbiss and Roy A. Guyer. Mr. DeVilbiss is the son of the late Thomas A. DeVilbiss, who conceived and developed the company's industrial division. Mr. DeVilbiss has been active in the company since his father's death in 1928.

Mr. Guyer, Sales Manager of the Spray Painting Division, has been with the DeVilbiss Co. for 29 years—practically from the very inception of its industrial division. He is widely known.

Extremely interested in trade organization activities, Mr. Guyer at present is Chairman of the Organization Committee, Used Car Institute. He has been a member of the organization's Operating Committee ever since it was founded. Mr. Guyer also is a member of the Shop Equipment Manufacturers' Group Committee, Motor Equipment Manufacturers' Association, as well as of numerous other organizations identified with the air compressor, rubber products and spray-painting equipment industries.

In addition to the appointment of Messrs. DeVilbiss and Guyer to vice-presidencies, the following officers were re-elected at the DeVilbiss annual meeting; Allen D. Gutchess, president; Frank A. Bailey, vice president and general manager, and Walter W. Conklin, secretary and treasurer.

WORLD'S GREATEST all around ELECTRIC TOOL

DRILLS—GRINDS—SANDS—SAWS
POLISHES—SHARPENS—CARVES

The new WHIZ ELECTRIC TOOL is the handiest power tool ever made. A rugged tool for power and precision work. Drills thru ¼ inch iron plate in 42 seconds or engraves intricate designs. Handles any material: Metals—Woods—Alloys—Plastics—Glass—etc. Saves time. Eliminates labor. Plug into any socket AC or DC, 110 volts. Chuck ¼ inch capacity. Ball bearing thrust. Powerful, triple-geared motor. STANDARD MODEL with Normal Speed (uses 200 accessories, instantly interchangeable.) Price only $7.95.

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FREE—Accessory outfit (Value $2) includes set of drills, mounted 1½ inch grinder, sanding discs, cutting wheels, mounted brush, polishing wheel, carving burr, etc. FREE with each Tool ordered NOW. We pay postage.

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Wood Staining

THERE ARE three types of powder stains: water-soluble, spirit-soluble, and oil-soluble. These powder stains, or stain powders, are the dry coloring matter which give the ultimate color to stains after they are diluted.

Water stain powders, which are the most widely used and considered the best, are made from coal-tar by-products called "Aniline". They are fast to light, permanent in color and bring out the full beauty of the wood. The quantity of powder to be used varies somewhat according to the strength of the powder, and the shade that is desired. Most stains of this type are "cut" in the proportion of 4-oz. to 8-oz. to the gallon of water.

In dissolving these powders there are several important points to be kept in mind. For example, a set of scales capable of measuring small fractions of ounces is recommended. Guess work will surely mean trouble. Each shipment of stain powder should be well mixed before reducing. Shake the can thoroughly, as particles of stain will float to the top. This can happen in your shop as vibration will cause this condition.

The liquid should be properly measured, as any variation will produce a darker or lighter shade. The temperature of the liquid should be uniform; just below the boiling point is considered best. Never cut a stain in luke-warm water once and boiling water the next time; if you do, you will get different shades. Never apply stain to wood that is hot; the resulting color will be darker due to warm stain penetrating deeper into the pores of the wood.

Always remember that a strong-

SANDING SURFACER

RANDOLPH Lacquer Sanding Surfacer No. 5193 is setting new sales records. It's fast-drying, free-sanding and geared for production requirements. Supplied in White or Gray. Without obligation, send for sample today!

Dopes—Thinners
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Power Graining Machine

1. Cycle time 25 seconds.
2. Will cover a surface up to 31" x 80".
3. Automatic roll cleaner.
4. Cuts production costs.

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NEW CROWN GUNS
Cut COST Per Piece PAINTED
with CROWN "20" • Gives Peak Performance on all types of Synthetic and Lacquer jobs • ALL CONTROLS . . . Spray Width, Material Flow and Air Adjustment . . . ON THE GUN! Write for Catalog.
CROWN SPRAY GUN MFG. CO.
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It's the latest

A New BOOK on HAND GRAINING

224 Pages, 6x9-in. Illustrated

Its contents are conveniently divided into 50 chapters—all about the art of hand graining to reproduce the exact grain, figure and color of variously-cut cabinet woods. All of the information is thorough, practical, easily understood and interesting. The book is bound in stiff red covers and lettered in gold.

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Practical Publications, Inc.
222 E. Ohio St. Indianapolis, Ind.

er solution of powder than is called for by your manufacturer may cause "bronzing", and your ultimate color will look muddy.

Another important factor to be kept in mind is to always store your stain in glass containers. If all these points are followed your stain problems should prove less troublesome.—R. N .F.

Enamels for Plastics

MANUFACTURERS using plastic housings or other parts in their products can now get the added sales advantages of bright cheerful colors, at relatively low cost, with the aid of recently developed enamels. The new finishes allow manufacturers to use less expensive brown and black plastic materials, and still give finished products a colorful appearance free from a "painted look."

While practically any desired color can be produced in the color-through type of plastics, these materials are somewhat more expensive, and many manufacturers are interested in the possibility of applying colors to the less costly plastics.

The biggest stumbling-block in coloring the brown and black plastics has been the high degree of adherence necessary for the successful coating of the smooth "greasy" plastic surface.

This difficulty has been overcome, it is claimed, with new enamels, which are of the baking type, and which can be supplied to give an opalescent finish if desired. It is reported that these finishes have been subjected to severe abrasion tests without marring or chipping.

The finishes are preferably applied by spray, and are baked at

SEA-LAC

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Clear Flame Proof Baking Synthetic

FOR BURN PROOF METAL PROTECTION

SEA-LAC "71" Flame Proof Synthetic—a clear water white finish for direct application to metal—burn proof, non-peeling, abrasion resistant—may be baked 20 minutes at 275° F., or 10 minutes at 300° F.

Another SEA-LAC *perfected* finish.

RATE your present finish against SEA-LAC for—

Film Integrity
Tensile Strength
Adhesion
Heat Resistance
Color Retention

WRITE FOR PRODUCTION SAMPLES AND INFORMATION

DURALAC CHEMICAL CORPORATION
NEWARK. N. J.

250° F. For the opalescent finishes, baking for one hour is required. Baking time for the non-opalescent finishes ranges from 45 to 60 minutes.

Many Colors Are Available

The range of colors in these new finishes offers plenty of opportunity for variation to meet consumer preferences. Opalescent finishes are available in taupe, red, gunmetal, silver, brown, gray, green, and two shades of blue. The non-opalescent coatings are made in red, ivory, white, three shades of green and two of blue.

In addition to their manufacturing economies, these enamels are expected to offer an opportunity to reduce inventories, since parts can all be produced from a single color of plastic, and can be finished for the requirements of specific models. The formulation of the finishes can be adjusted to give satisfactory adherance on different types of plastics—U. S. I. CHEMICAL NEWS.

Wet-Rub Primers Desirable

WET-RUB primers are particularly desirable for use on products formed of lead-coated sheet steel. One reason is because you must use a type of primer that will not take up moisture in wet rubbing, hence you will have a waterproof primer — which is always preferable.

Another reason is that lead-coated sheet steel really has an orange-peel surface, although when you look at it with the naked eye it appears to be perfectly smooth. As a rsult you have still more orange-peel effect after the primer is sprayed on.

ATTENTION!!!
Furniture Manufacturers:

GKS FORCED DRYING SYSTEMS
for wood furniture finishes

OFFER FIVE ADVANTAGES!

Here's how they can save money and increase production for you.

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4. **Reduced finishing material cost.**
5. **Tougher, more durable finish.**

GEORGE KOCH SONS EVANSVILLE INDIANA

Ask us how you can learn more about the GKS Forced Drying Systems.

When the coat of primer becomes thoroughly dry — at least one hour after spraying — rub it with No. 280 sandpaper and water. Rub it to a smooth glass-like surface. This can be done as quickly as dry sanding and it gives you a better surface on which to "build" your finish. When it is properly done, wet sanding removes all orange-peel effects. This is a great help in the final results, as the color coats must be applied without sanding; also the clear coats.

The wet-rubbed primer coat helps to give more depth to the finish due to its smoothness. Depth of finish cannot be obtained over a rough surface.

Wet rubbing of the primer means far less rubbing of the top coats of clear, because of the smoothness of the finish.

I have tried all kinds of methods in lacquer finishing lead-coated steel products, where bronze powders and ready-mixed colors are used, and the system I have just described is the best—that is, insofar as I know.

Wet-rubbing primers can be purchased just as cheaply as dry-sanding primers and, because of the fact that if they are properly formulated they are strictly waterproof, I think they are by far the best type of primers to use in metal-casket finishing, for example. —F. HAGAN.

John T. Ryan, President of Mine Safety Appliances, Dies

John T. Ryan, 57, President of Mine Safety Appliances Co., Pittsburgh, Penna., died Feb. 20, in Miami, Fla.

During his entire business life, Mr. Ryan was actively identified with the

mining industry. From 1911 to 1914 he was in charge of the mine rescue and safety, and mine-lamp testing division of the U. S. Bureau of Mines. In 1914 seeing the need for more adequate safety equipment, he and George H. Deike of Pittsburgh, founded the Mine Safety Appliances Co., which today is the largest manufacturer of mining and industrial safety equipment in the world.

In 1915 Mr. Ryan worked with Thomas A. Edison in the inventor's laboratory at West Orange, N. J., on the design and development of the Edison safety cap lamp, which is so universally used today. In December, 1940, he was made an Honorary Member of the Edison "Old Timers' Club," comprised of men who worked with the late inventor in his early years.

Mr. Ryan was a member of several mining and metallurgical organizations.

Surviving are his widow, a son, John T. Ryan, Jr., and two sisters, all of Pittsburgh.

American-Marietta Co. Elects Officers

Meeting in the general offices of the company, Jan. 24, the stockholders of American-Marietta Co. (Mfr. of finishing materials) elected one new member to its board of directors and the board appointed two new vice-presidents.

Grover M. Hermann, Jr., son of American-Marietta's board chairman and president was elected to the board, while C. S. Beaver, general manager of the company's operations at Marietta, Ohio, and High Point, N. C., and Muir Rogers, manager of the mid-western industrial finishes division, were elevated to vice-presidencies.

Board members who were reelected were G. M. Hermann, chairman; G. A. LaVallee, C. S. Beaver and R. L. Oughton.

In his report to the stockholders, President Hermann pointed out that the company had reached a new peak in 1940 with an increase in net shipments of 18.5% over 1939. The industry as a whole reports a net gain of less than 5% for the year.

Solvent Bulletin is Free

The benzol-toluol-xylol-solvent naphtha family is the subject of "Koppers Coal Tar Solvents" (Form TD-8), a leaflet published (Jan. 23, 1941) by Koppers Co., Tar and Chemical Division, Pittsburgh, Penna. These solvents, derived from coal tar, are used in the manufacture of chemicals, lacquers, paints, leather, rubber, printing inks, pharmaceutics and electrical goods. Characteristics of Koppers standard coal-tar solvents are given in a table.

A Superior Varnish for Fir or Gumwood

RX-239 SPEED - DRY VARNISH

A vastly improved, production-proven clear gloss varnish. Dries in 2-3 hours even in cold weather. A single spray coat provides the build and appearance of 2 coats of ordinary varnish.

For economy as well as for faster production, you will find that one coat of our special lacquer sealer followed by one coat of SPEED-DRY VARNISH is an unequalled combination for spray finishing fir or gumwood.

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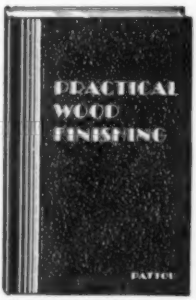

Tells EVERYTHING you need to know about Wood Finishing. Includes types of unfinished furniture, choice of finishes, brushes, accessories, precautions, natural finishes, staining, filling and bleaching, varnish, enamel or paint finishes, finishing with a spray gun and many other fascinating practical subjects. Also includes complete section on furniture repairing and refinishing. Four pages of 32 different foreign and domestic woods illustrated in natural colors. 112 pages fully illustrated.

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Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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EDITORIAL

Hand Fire Extinguishers Put Out Many Fires

Hand fire appliances provide the greatest saving of property and life of all fire protection equipment, H. W. Lange, assistant engineer of the Underwriters' Laboratories, Inc., told the National Safety Congress in Chicago recently.

"Fifteen percent of the fires upon which alarms have been given to the Fire Department are extinguished before the arrival of Fire Department equipment," he said. "Sixty percent of the fires which the Fire Department is called upon to control are extinguished with hand fire appliances. Fifty to 90% of all the fires occurring in industry are extinguished with hand fire appliances without the necessity for calling in the Fire Department."

He cited the experience of one large industry employing hand fire extinguisher protection, where over 3000 fires occurred during the course of a year, and all but two or three of them were extinguished with hand fire extinguishers. The fires which did not require hose streams involved little or no interruption of business or the losses attributed thereto. The fire and water damages involved in such fires naturally were kept at a minimum and the consequent losses of life and property were practically eliminated.

Highlights of Certain New Furniture Styles and Finishes

★ The style story of Chicago-made presentations at the January Furniture Show confirmed the growing trend toward elaborate ornamentation of period pieces—largely of 18th Century and Regency inspiration—and further smart developments in modern patterns, with sectional furniture to the fore. The use of light finishes was more pro-

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

nounced, resulting not only from the upswing in number of modern pieces exhibited, but from groups in traditional styling which sponsored this enlivening effect.

Inlay designs reached new heights on occasional furniture, ranging from colorful floral motifs on table tops to intricate swag and rosette patterns covering large areas. The flair for adding extra trays, drawers, shelves, and drop leaves brought a flood of clever conceptions, all reflecting a plus of convenience and originality. Also, progress was shown in the adoption of plastics for trimming and in the union of metal and wood in unusual treatments.

The chief new attraction at one exhibit was a group of unusual glass-topped pieces having pickled mahogany bases, carved in swan or crane representations or Regency plumes.

Featured presentations of another manufacturer included a distinctive aspen and maple group of 18th Century inspiration, with unusual design features, and delicately inlaid; also highly styled Regency numbers, some in black and gold; and other outstanding pieces such as glass-topped tables with plant stands centered below.

One manufacturing concern enlarged its occasional furniture display with Sheraton and Hepplewhite pieces in mahogany, finely styled in related designs and lavishly inlaid; and made sizable additions to its promotional 18th Century group. In its modern line fashined of walnut, more wheat finishes and pieces of larger size reflected the demand for this type of merchandise.

Another company introduced Regency occasional pieces of notable originality, among them being a group of mahogany tables having plexiglas trim. Others enriched mahogany with silver Regency decorations and chromium ferrules; a third group of 10 numbers featured gold-toned mirror tops and aprons; while still another showed heavily carved bases of pickled mahogany and tops of plate glass.

Interest at still another exhibit centered about numerous novelty pieces offered in dark mahogany and wheat finishes — the latter shown for the first time at the January market. Among the new 18th Century design interpretations were music stands, record cabinets, very small what-not shelves of novel pattern, hanging wall cabinets, magazine baskets, and cocktail tables.—THERESA WALLACH.

Better Informed Salesmen Are Now Calling on the Trade

★ As far as trends in the finishing industry, I might say that the thing I have noticed most, in my contacts with suppliers, is the rather rapid evolution that has been made in sales technique. A few years back, when royalty lacquers were the principal commodity of all finishing houses, sales to the woodworking industry were made largely on the basis of friendship. Rapid strides have been made in the development of varnishes and as the "Old Timers" drop out they are being replaced with better informed salesmen.

I think, for the greatest part, the aggressive finishing houses have recognized the fact that, in its liquid form, all finishing material resembles all other finishing material—and that the only way solid permanent sales contacts can be made is through a more technical approach.

In our experience, over the last

four or five years, it is obvious that the majority of suppliers have spent a good deal of money developing their technical facilities. A few years back there was hardly any convenient way to have finishing materials tested for durability, color-fastness, alcohol resistance, etc.

Today practically all of the wide-awake people in the industry are more than willing to run blind tests on any competitive materials. They seem eager to sell their material on the basis of its merits, and in most cases they ask for no exceptions under the guise of past favors done.

In my observation I can enthusiastically say that the finishing game has become highly ethical and for the most part the field representatives seem eager to be of constructive service.—STEPHEN J. MURPHY.

More Efficient Equipment Needed in Modern Finishing

★ All of the major advances of civilization are brought about by the demand for improvement. American industry is amply provided with engineering and scientific skill to improve its products, provided the user makes his wants known.

The point is this: Tell your salesman-agent your troubles, point out his products' shortcomings, and give his company's laboratory staff some idea of what the man behind the gun is looking for. The world's largest manufacturer of motor cars makes a practice of sending out questionnaires to customers, asking them for suggestions on future models—and faults with the past models.

After all, the production finishing room is the manufacturer's "proving ground".

As to new equipment, I think mention could be made of the following items:

1) Stir-top cans, featured by auto-finish manufacturers, are especially handy for seldom-used materials.

2) Solvent-resisting fluid hose has long life, flexibility, and no disagreeable odor; it does not discolor lacquer.

3) Machines for dispensing masking tape and paper together from separate rolls. I see a lots of these in auto-repaint shops.

Today there is real need for more efficient equipment because of the increased cost of materials and labor.—AL. MATLOCK.

White Enamels Stand More Severe Tests and Exposure

★ The demand for superior white enamels has resulted in a great improvement in them. Chemists are busy constantly improving these materials for a vast field that demands the best. We have had alkyd and urea-type white enamels—and now "melamine" resins. Through the combined use of these resins, I believe they are responsible for the great improvement we have noticed while making tests from various companies' white enamels.

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A year or so ago, only occasionally could a white be found that would stand a severe grease test, such as E. P. grease, Marfak hypoid, and many others. But in the past few months I have found that most companies' white enamels stand an excellent grease test. Also, the impact test and resistance to yellowing seem better than previously. Throughout the field of white enamels I think they are greatly improved and superior to what they were a year ago. This has all come about because of the increased demand for highly finished products.—HOWARD F. DEAN.

Exchange Finishing Knowledge

★ One of America's oldest and most successful manufacturers of automobiles has long practiced the theory that technical developments of his organization, passed on freely to his competitors, would reap immeasurable profits to every member of the industry, including himself.

We all have visual evidence of the truth of this policy, for it has advanced the standards of American transportation to heights undreamed of 20 years ago.

All lines of industrial endeavor can profit by this lesson—and especially the finishing field. Let us not be niggardly about passing on information, even though it has been gained through arduous hours of experimentation.

It is gratifying to see a few furniture manufacturers follow the cue and send their finishing foremen to the markets and to large furniture stores to glean new information, and to find out first hand what the public reaction is regarding the products they help to manufacture.

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It is a step in the right direction and the expenditure of time and money will certainly prove worthwhile and will eventually lead to a healthier and more vital industry.

We might at this point suggest that someone influential in the finishing industry start a "Finishing Clinic", with meetings annually or semi-annually. This certainly isn't an innovation, as many societies, such as the "American Chemical Society", "American Society of Engineers", etc., conduct them regularly. Foremen from each plant could be spared for a day or two each year to participate in the "Clinic". A society of this type would create new ambitions among the younger generation of finishers and stimulate the desire for making finishing a career, and automatically instill a keener interest in the modern furniture and industrial world.—N. H. VOIGT.

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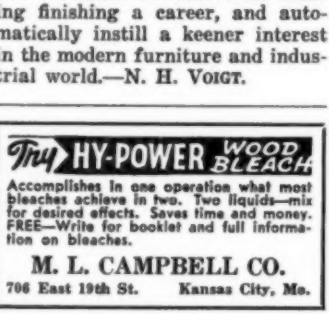

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See How Paints Are Made To Appreciate Their Value

★ When things in the paint shop go wrong, when finishes don't finish properly, when colors don't match, and when any of dozens of irritating things happen, we in the supervisory end of the business look for a scape-goat. Too often we select the paint manufacturer for that honor.

Maybe it's because too many of us do not know how paint is made. Maybe we have only a hazy picture of the science, skill and care that go into the manufacture of every gallon of paint.

Every person who uses or supervises the use of industrial finishes would find that a day spent in a paint factory is a very much worthwhile investment. Go through the factory from top to bottom. Watch the manufacture of paint from raw material to shipping room. Note well the sampling, the testing and the careful laboratory control of every step of manufacture. After a day so spent you will come back to your own shop with a much better appreciation of the product you are using. Also, you will know better how to use it.

I know whereof I speak, because recently I spent such a day in a modern paint factory at Dayton, Ohio.—V. MARCONETT.

How to Correctly Appraise The Value of a Spray Man

★ Many times the value of a spray man is judged entirely by the quantity and quality of work he produces each day; that is, if he turns out plenty of work and if at the same time his work is of good quality, he is considered a very good spray man.

But Mr. Foreman, how much is it costing your company for this man to produce this work? I do not mean the actual wages the company pays him per hour or per day. Have you ever watched him closely to see if he is wasting material unnecessarily in spraying?

The average spray man handles many dollars worth of finishing material every working day, therefore it is important that he be properly trained so as not to waste a lot of material. If the spray man holds his gun too far from the object being sprayed (the spray gun should be held from 6 to 8-in. for lacquers, sealers, etc., and from 8 to 12-in. for varnishes, oil enamels, etc.) or if he makes his strokes too far beyond the end piece being sprayed, and doesn't release his gun trigger at the end of each stroke, a large percentage of his material will go out through the exhaust fan. Or he may jump from end to end or from post to post of the piece being sprayed, instead of starting correctly and going methodically over the piece.

A spray man who produces plenty of good work each day, and at the same time does it in an efficient manner, is a valuable asset to any company.—H. W. CHESTER.

Finishing Superintendent

★ What is the job of a finishing superintendent? "That's easy to answer," says the person who is not familiar with finishing. "All he has to do is see that the work delivered to him is finished on time according to manufacturing schedule." That answer might be perfectly correct if finishing were a standardized procedure, remaining unchanged from year to year.

It so happens, however, that today finishing is not standardized. Materials, methods, equipment are constantly changing — in the last decade, changing almost before yesterday's advances have been made use of.

The finishing superintendent, therefore, must think of things other than merely getting his work out. That is, he must think of other things if he is to keep pace in making his department more efficient, producing better finishes, improving working conditions, etc. For example, he must be on the lookout for any new methods that are faster, for new materials that are cheaper and better, for any way to eliminate scrap and reduce rejects. He must work to reduce paper forms and routine, to eliminate safety hazards, to reduce

★ Keep flying paint spray out of workers' eyes and nose, and off their clothes. "Wild" spray costs you money—it hampers their work, often injures their health. Equip with this CESCO Paint Spray Mask and be SAFE. Completely protects neck, head and shoulders. Extremely light weight, comfortable, convenient. Large Plastacele window permits wide vision—slides out easily for cleaning and replacement. Hood, attached to cap, fits snugly over shoulders. Air tube permits compressed air connection if desired.

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maintenance. In short, he must be a combination superintendent, engineer, chemist, methods man and accountant.

No, the job of finishing superintendent is not an easy one. It is a tough one with no question.—F. J.

Automatic Fire Protection

A great many finishing departments are equipped with obsolete or antiquated extinguishing equipment which would be incapable of coping with fires of any unusual type, and which might lead to a disastrous or at least crippling blaze. Some finishing rooms have nothing more effective than water-type extinguishers or perhaps one or two foam units. You can visualize what would happen if an accidental upset or overflow occurred in the presence of a spark or flame.

One thing that makes this situation particularly timely at the moment is the ever growing danger of sabotage by fire, particularly in plants working on national defense orders.

Like everything else unpleasant, the subject of fire is so easily skipped over and action deferred—until one is jogged out of his complacency by an occurrence that calls attention to the presence of real danger, a manufacturer is apt to keep the same fire-extinguishing equipment with which he started business, forgetting that vast changes have been taken in the science of fire fighting in the last few years, and that he can avail himself of these improvements at relatively low cost.

We have seen some of these small carbon dioxide systems, particularly where they are of the local application type. They are not expensive, but they certainly are effective.

In a factory in Brooklyn, N. Y., recently, they had a dip-tank fire that seemed to involve the whole room in a few seconds. The engineer completely forgot that he had a carbon dioxide system installed. When the gas was automatically discharged the fire was out so quickly that they are still recovering from their amazement.

Recent developments in our laboratory have made it possible for us to produce what we believe to be the ideal lacquer for wooden picture frames and moldings. A lacquer that is lasting and beautiful, permanent in shade and sheen, and that requires no undercoating or sealing of the wood. The formulation of this lacquer is such that it will prime the surface and build up the surface defects of the wood as well as produce a beautiful finished coat, all in one operation.—J. M. Co.

Dry Staining Process

In a brief paragraph in January, 1941, issue of this magazine, some hint was given to the effect that a dry staining process is in course of development. This process will involve the use of mechanical equipment to apply the dry pigment to the wood.

While we are still not at liberty to publish full details and names in reference to this process, we do have the following additional information from the chief engineer of the company now engaged in developing the process:

"Dry pigments, dyes and other coloring materials are properly combined with abrasives and then blasted by means of airless equipment into the pores or grain of the wood. The abrasive acts as a vehicle and actually impregnates the coloring matter into the wood. The merits of applying stain and paint in dry form are many, for example, elimination of drying time, wiping and wiping rags, grain raising, and sanding after staining. The results are excellent in every respect.

"Sap-stained and mineral streaked woods are beautifully finished in the lighter shades of blond, Swedish Modern, lime oak, etc., eliminating painted effects and enhancing the natural grain.

"Interior trim, wall paneling, etc., can be treated in many new and unusual shades and effects . . at high rate of feed and at very low cost."

We understand that the same dry pigments that are used in wet staining will be used in this new dry staining process. The new process will merely eliminate the solvents or wet vehicles that carry the stain pigment over the surface and into the pores of the wood.

Defense Orders; Fire

RECENTLY there was a disastrous fire in a Brooklyn, N. Y. factory where they were making lockers for the U. S. Army. This fire caused a loss of lives and considerable property damage.

Workers who were either careless or ignorant and unfamiliar with the work at hand had taken to heating the olive drab enamel over an open flame to thin it for spraying. This caused a small container of enamel to burst into flames. More unfamiliarity and lack of responsibility caused those in the room to flee in panic instead of seizing fire extinguishers and fighting the fire. Of course, it quickly gained headway and was only subdued after hours of work by the city fire apparatus.—J. K. C.

New Wrinkle Finish Bulletin

The Roxalin Flexible Lacquer Co., Elizabeth, N. J., has issued a 4-page bulletin on Rincontrol, their new wrinkle finish. This 8½x11-in. bulletin includes a sample finished panel and illustrates and describes eight exclusive Rincontrol features. Also shown are several outstanding products using this latest in textured-enamel finishes.

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Blackens Steel Products Chemically

Information on the use, merits and possibilities of "Pentrate," a patented process for applying an attractive and durable black finish on products made of steel, is revealed in a 20-page booklet published by the Heatbath Corp., Springfield, Mass. "Pentrate," the company declares, will not chip, peel, crack, craze or rub off. It is applied through a penetrating chemical action. Sheet steel may be formed or bent after "Pentrating."

Metal-Cleaning Exhibit by Oakite

How several recently developed materials and methods are effectively helping industry speed-up production cleaning and increase output on both National Defense Orders and normal peace-time products, will be featured at the Machine and Tool Progress Exhibition, Detroit, Mich., March 25-29, by Oakite Products, Inc., New York, N. Y.

The first of these developments is a new speedy method of cleaning aluminum before spot-welding. It is reported to make possible more welds before electrodes must be cleaned and to provide greater safety to both personnel and parts. Among other Oakite developments to be shown which are of particular interest to aircraft and other plants fabricating aluminum or its alloys, are safe materials and methods for cleaning heat-treated aluminum parts; cleaning before anodizing, or similar protective surface treatment; and cleaning before brazing and such finishing operations as plating, lacquering and painting.

In addition to these production operations, the exhibit will depict in motion the application of Oakite materials for washing iron and steel parts by tank and machine methods before inspection and assembly; cleaning cold-rolled steel, buffed brass, copper and other metals and alloys before plating, tinning and galvanizing; rust-proofing parts in process or for storage; cutting and grinding; drawing and stamping; burnishing and tumbling.

Bent Wood Plastics

A new method for plasticizing wood is announced by the Forest Products Laboratory of the U. S. Forest Service at Madison, Wis. Comparatively simple in operation, reasonably inexpensive, and of apparent application in the bending of wood and in the production of cheap plastics and molded articles, the new treatment is a by-product of the Laboratory's research on the chemical seasoning of refractory woods.

During the course of seasoning experiments it was found that oak which had been soaked in a concentrated solution of urea and then dried became plastic and capable of being bent, twisted, and compressed when a temperature approximately 212°F. was reached and while the wood was still in the dry condition. The wood retained its plasticity while at or above the critical temperature and resumed its normal hardness and rigidity when cooled, retaining its altered shape unless reheated.

In addition it was found that urea-impregnated wood, when subjected to elevated temperatures and pressures, could be compressed to a density approaching that of basic wood fiber, and that in becoming self-bonding with the urea-lignin produced by the treatment, they form a material of true thermoplastic properties.

Although the new process apparently has wide possible application in wood bending and in the production of cheap plastics, the Forest Products Laboratory has so far been obliged to ignore specific applications and concentrate its available research effort on exploring fundamentals of the treatment.

Thermoplasticity, as produced in wood by the urea treatment, should be useful in the molding of a variety of wooden articles, including those produced by the molding to shape of large plywood sheets. Patents covering the new plasticizing process have been applied for by the Forest Products Laboratory.

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Outdoor Paintings in Porcelain Enamel on Steel

The world's first outdoor art-gallery is soon to be "hung" in a 600-ft. long sunken garden that is being built at Sunset Memorial Park in Cleveland, Ohio. The Ferro Enamel Corp. states that the pictures will be "painted" in finely-ground glass colors, or in other words, porcelain enamel, on heavy panels of steel. The "painting" process consists of first applying the colors and then firing the coated panels at such high temperatures that the colors are welded into the pores of the metal. Porcelain enamels for the Sunset paintings were manufactured by Ferro.

The porcelain enameled paintings will be copied from the finest classical and religious works of old masters. There will be 38 pictures; 36 will be 44x54-in., and two will be 60x84-in. in size.

Each picture will be framed in a wide frame, embossed in the metal itself and finished in bright gold porcelain enamel. The pictures will be mounted by means of an ingenious framework, anchored in a concrete base. Trees and shrubbery will surround each picture, so that it appears to be hung in a natural setting.

Using a special mixture of oils and ceramic color oxides, the artist applies his colors to the white porcelain enameled panels in much the same way we would apply regular oil colors to canvas. The same flexibility, the delicacy or boldness of stroke, the same blending of colors—all are as possible on porcelain enamel with this material, as with ordinary paints on canvas.

After painting the complete picture, using in some cases practically every color on the artist's palette, the panels are thoroughly dried and then fired. Only the one fire is necessary, although if retouching is required, an extra firing can be given the panel without affecting it.

The frames for the pictures are first porcelain enameled in black. Then a coating of liquid gold is applied and fired, resulting in a "gilded" frame which sets off the pictures very well.

Over this coat of liquid gold, as well as over the entire surface of the enameled paintings, a thin coating of a clear acid-resisting overglaze enamel will be applied to insure excellent weather resistance of the finish.

Cast bronze plaques, with the title of the picture and the name and dates of birth and death of the original artist will be fastened to each picture-frame.

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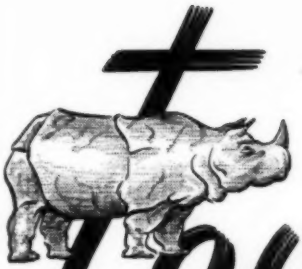

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